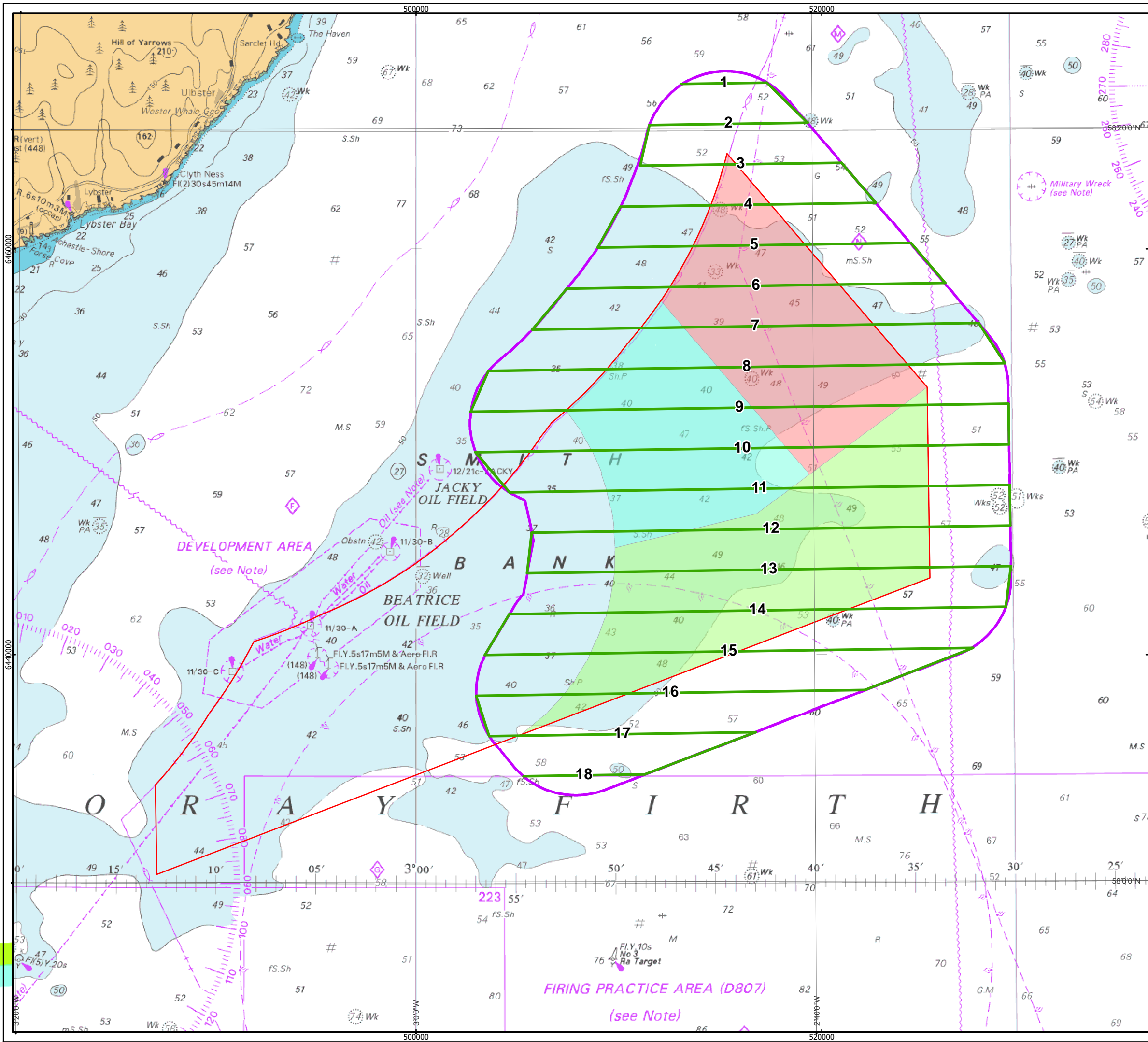


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Moray Offshore Renewables Ltd

KEY

- Boat-based survey transects
- Boat-based survey area
- MacColl Windfarm
- Telford Windfarm
- Stevenson Windfarm
- MORL Zone Boundary

Horizontal Scale: 1:180,000 A3 Chart
 0 4,000 8,000 Meters

Geodetic Parameters: WGS84 UTM Zone 30N

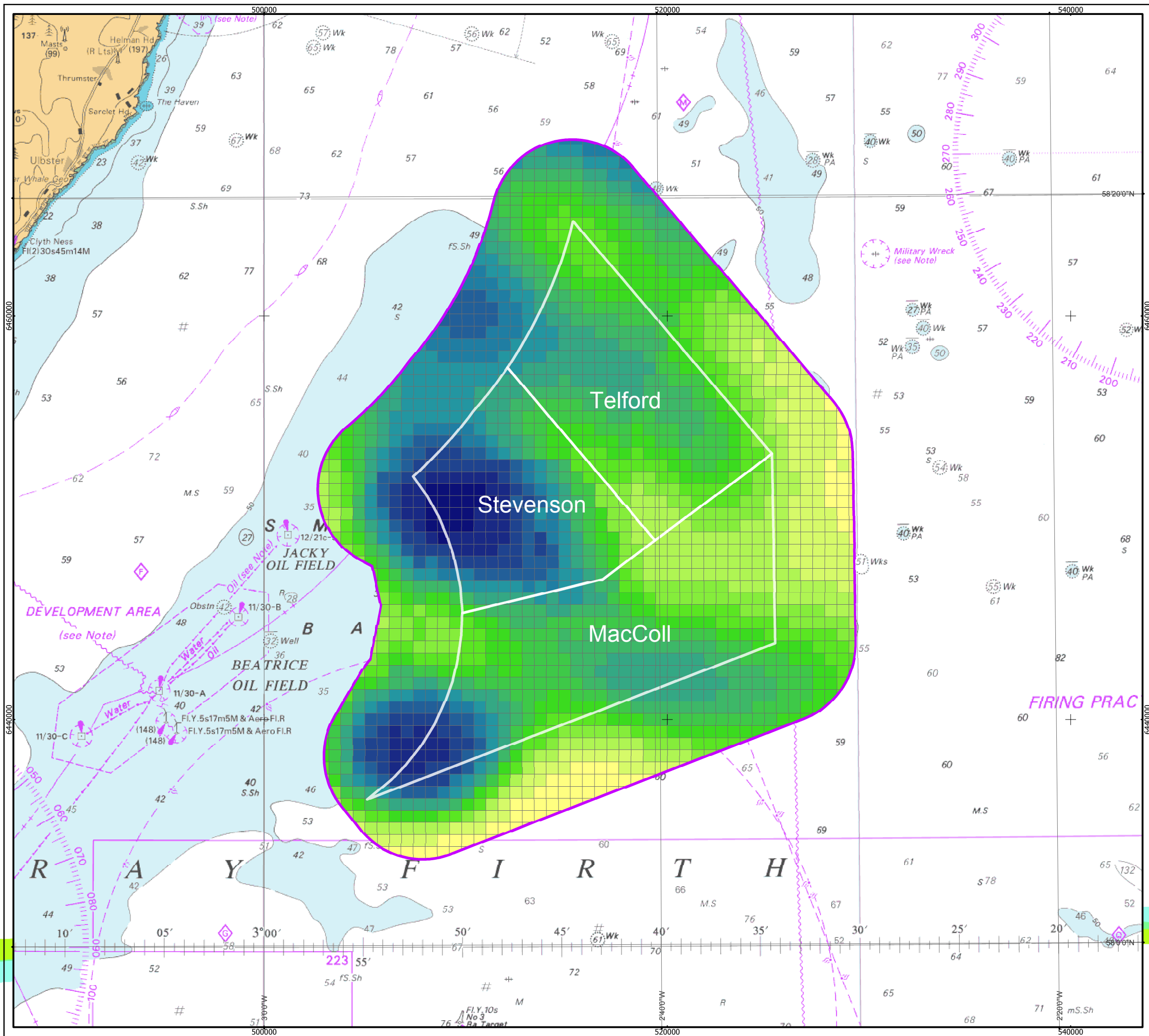
Produced: LG
 Reviewed: CJP
 Approved: PH

Date: 16/11/2011 Revision: A
 REF: 8460001-PPW0201-NPW-MAP-004

Figure 4.5-1: Boat-based Survey Area (2010 - 2012)

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Moray Offshore Renewables Ltd

KEY

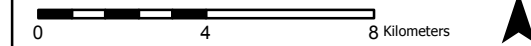
Boat-based survey area

Predicted fulmar density*
(birds per 600m grid square)

- 0.16 - 0.41
- 0.41 - 0.57
- 0.57 - 0.71
- 0.71 - 0.85
- 0.85 - 1.14
- 1.14 - 1.28
- 1.28 - 1.46
- 1.46 - 1.69
- 1.69 - 1.98
- 1.98 - 2.26
- 2.26 - 2.75
- 2.75 - 3.55
- 3.55 - 4.77
- 4.77 - 6.40

*Numbers based on data for April 2010

Horizontal Scale: 1:180,000 A3 Chart



Geodetic Parameters: WGS84 UTM Zone 30N

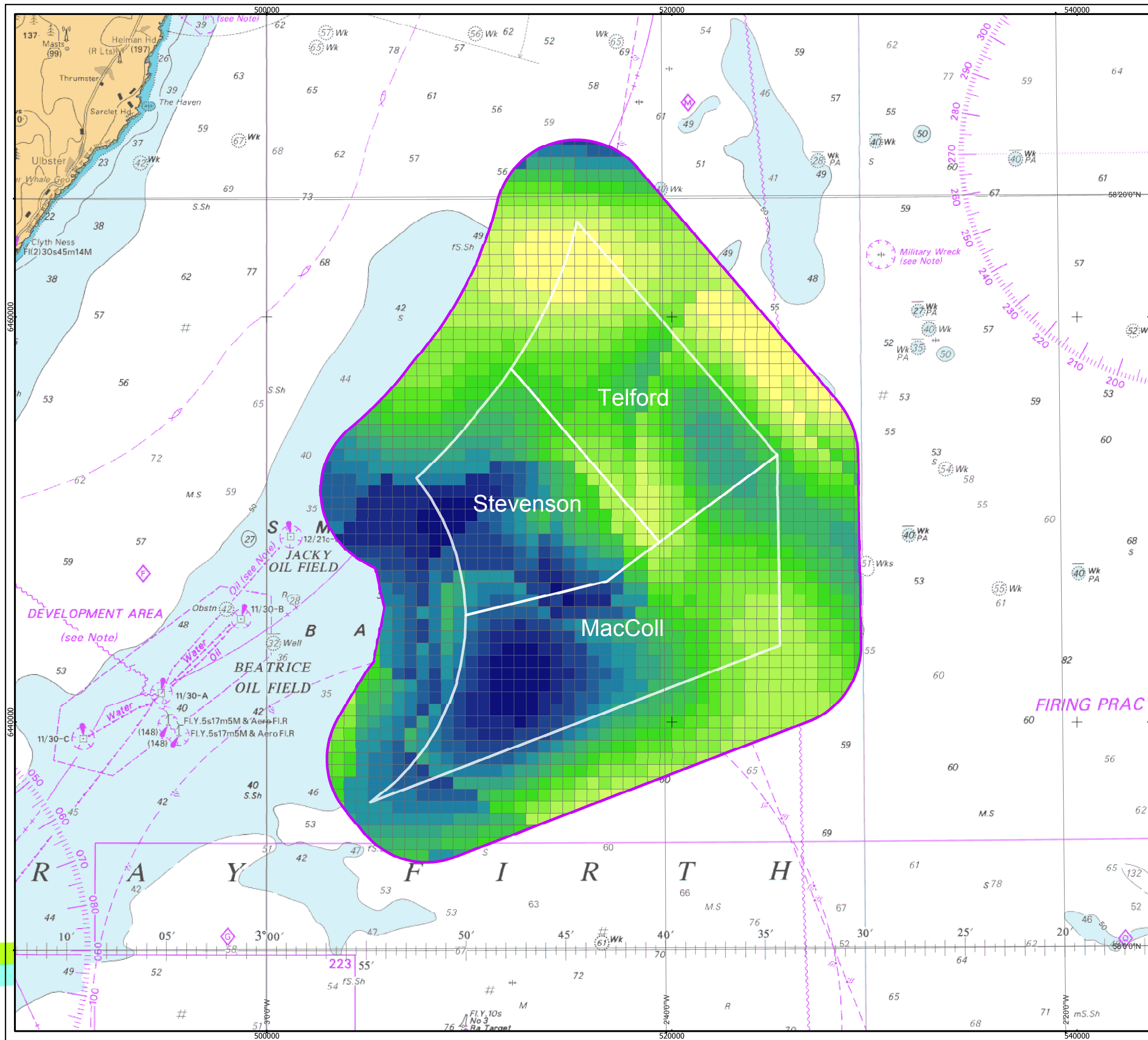
Produced: LG
Reviewed: CJP
Approved: CR

Date: 27/03/2012 Revision: B
REF: 8460001-PPW0201-NPW-MAP-005

Fig 4.5-2 Predicted Density of Fulmar using the Sea

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KEY

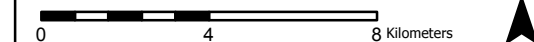
Boat-based survey area

Predicted gannet density*
(birds per 600m grid square)

- 0.02 - 0.04
- 0.04 - 0.05
- 0.05 - 0.07
- 0.07 - 0.08
- 0.08 - 0.10
- 0.10 - 0.12
- 0.12 - 0.14
- 0.14 - 0.17
- 0.17 - 0.20
- 0.20 - 0.23
- 0.23 - 0.27
- 0.27 - 0.33
- 0.33 - 0.40
- 0.40 - 0.50
- 0.50 - 0.64

*Numbers based on data for April 2010

Horizontal Scale: 1:180,000 A3 Chart



Geodetic Parameters: WGS84 UTM Zone 30N

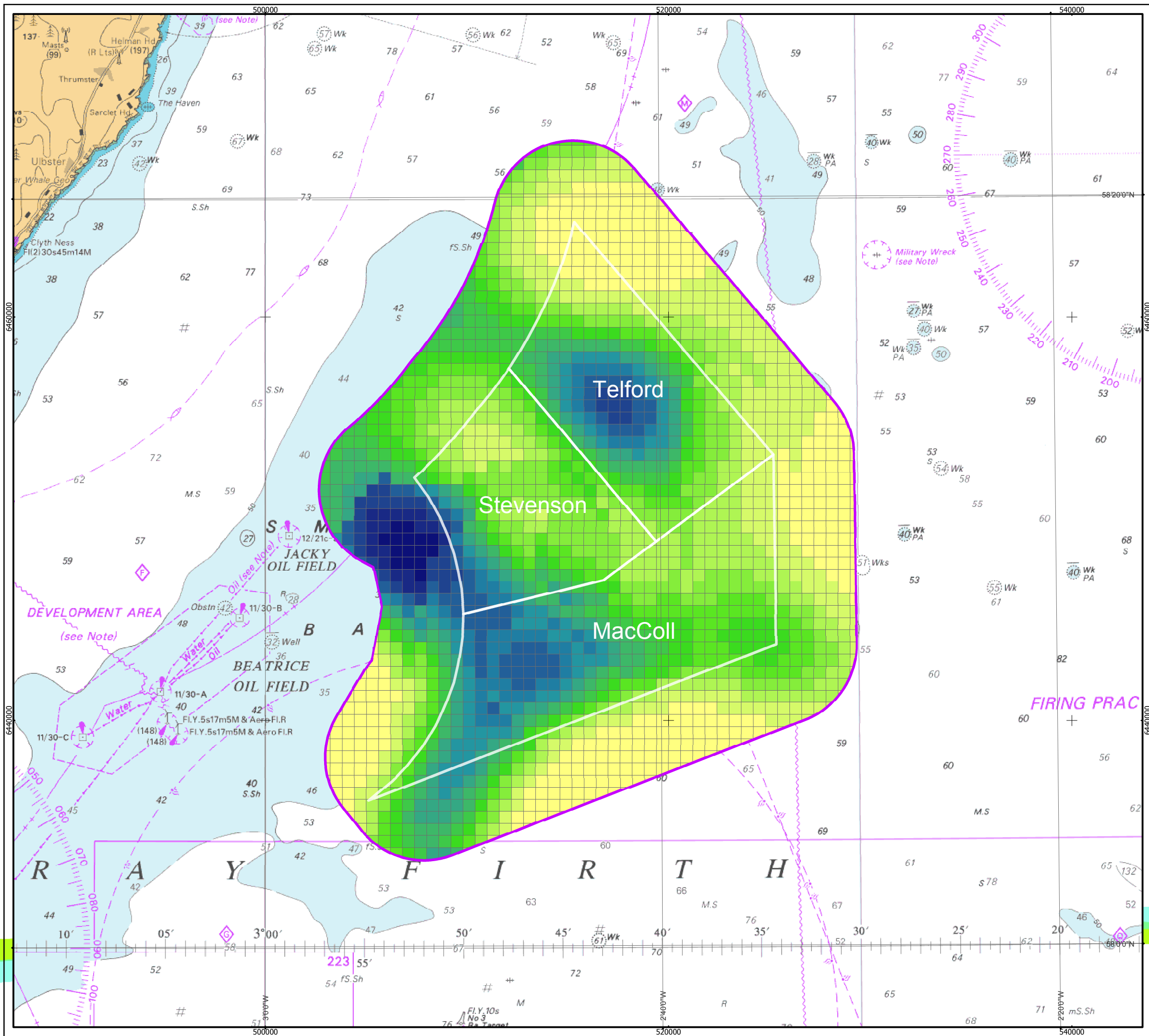
Produced: LG
Reviewed: CJP
Approved: CR

Date: 27/03/2012 Revision: B
REF: 8460001-PPW0200-NPW-MAP-006

Fig 4.5-3 Predicted Density of Gannet using the Sea

Moray Offshore Renewables Ltd

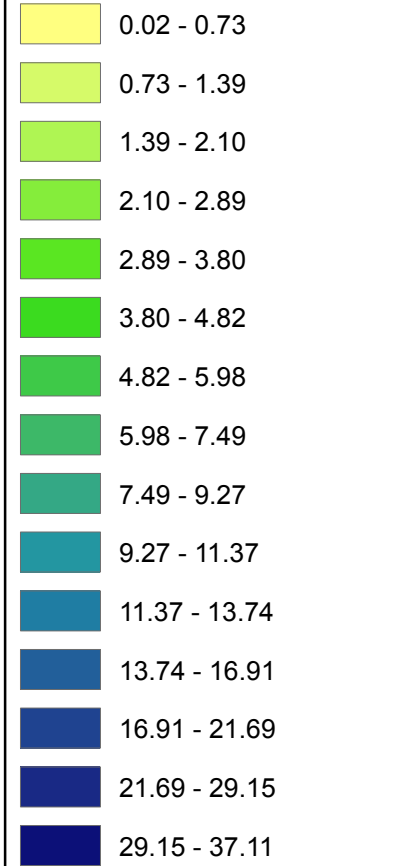
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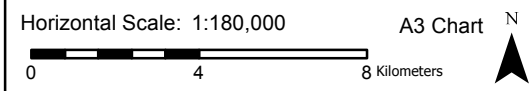
Moray Offshore Renewables Ltd

KEY
 Boat-based survey area

Predicted kittiwake density*
(birds per 600m grid square)



*Numbers based on data for May 2010



Geodetic Parameters: WGS84 UTM Zone 30N

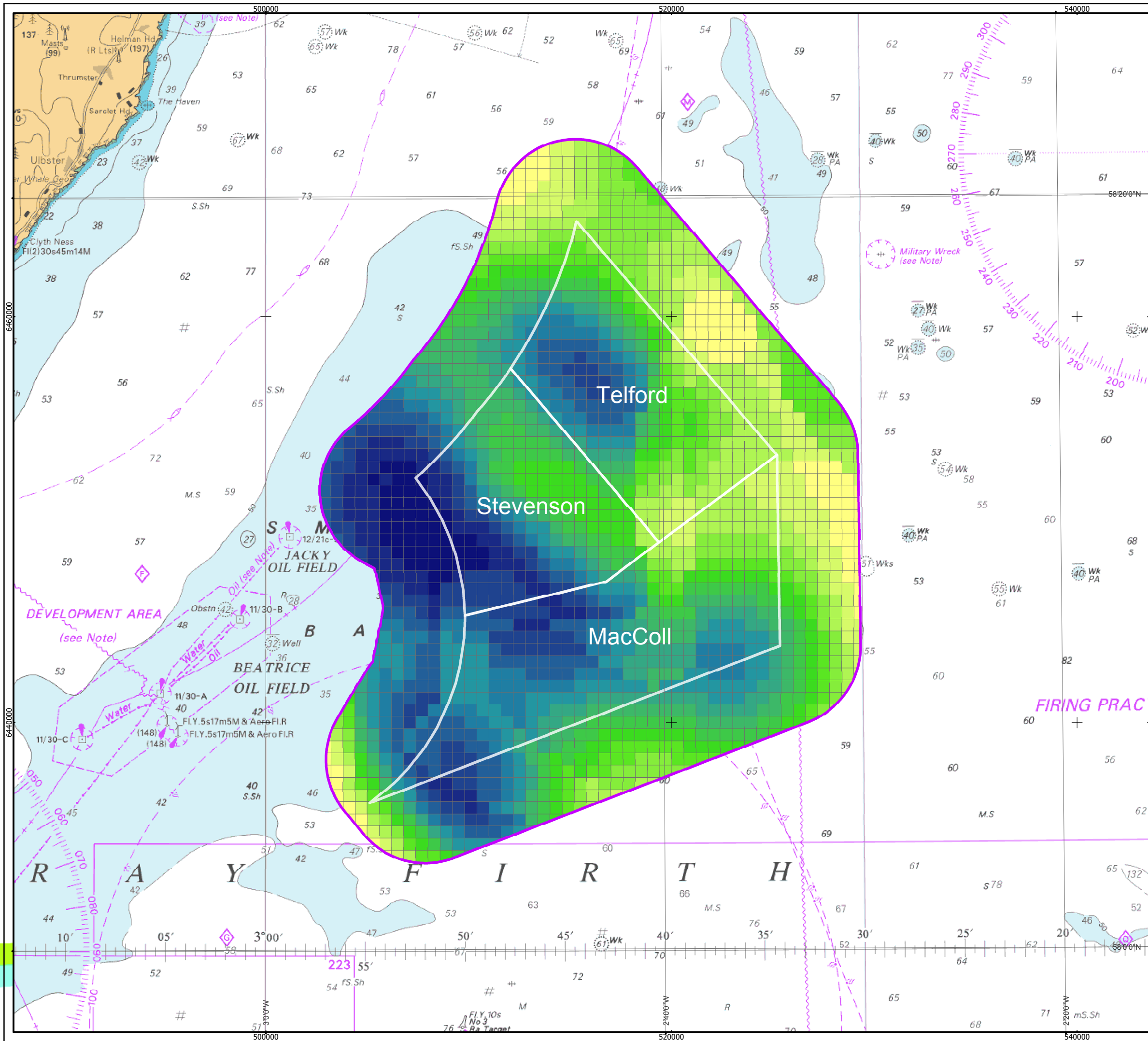
Produced: LG
 Reviewed: CJP
 Approved: CR

Date: 27/03/2012 Revision: B
 REF: 8460001-PPW0201-NPW-MAP-007

Fig 4.5-4 Predicted Density of Kittiwake using the Sea

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KEY

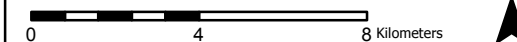
Boat-based survey area

**Predicted guillemot density*
(birds per 600m grid square)**

- 2.87 - 4.99
- 4.99 - 6.07
- 6.07 - 7.03
- 7.03 - 8.12
- 8.12 - 9.44
- 9.44 - 10.92
- 10.92 - 12.70
- 12.70 - 14.42
- 14.42 - 16.39
- 16.39 - 18.72
- 18.72 - 21.48
- 21.48 - 24.88
- 24.88 - 29.66
- 29.66 - 36.37
- 36.37 - 46.58

*Numbers based on data for May 2010

Horizontal Scale: 1:180,000 A3 Chart



Geodetic Parameters: WGS84 UTM Zone 30N

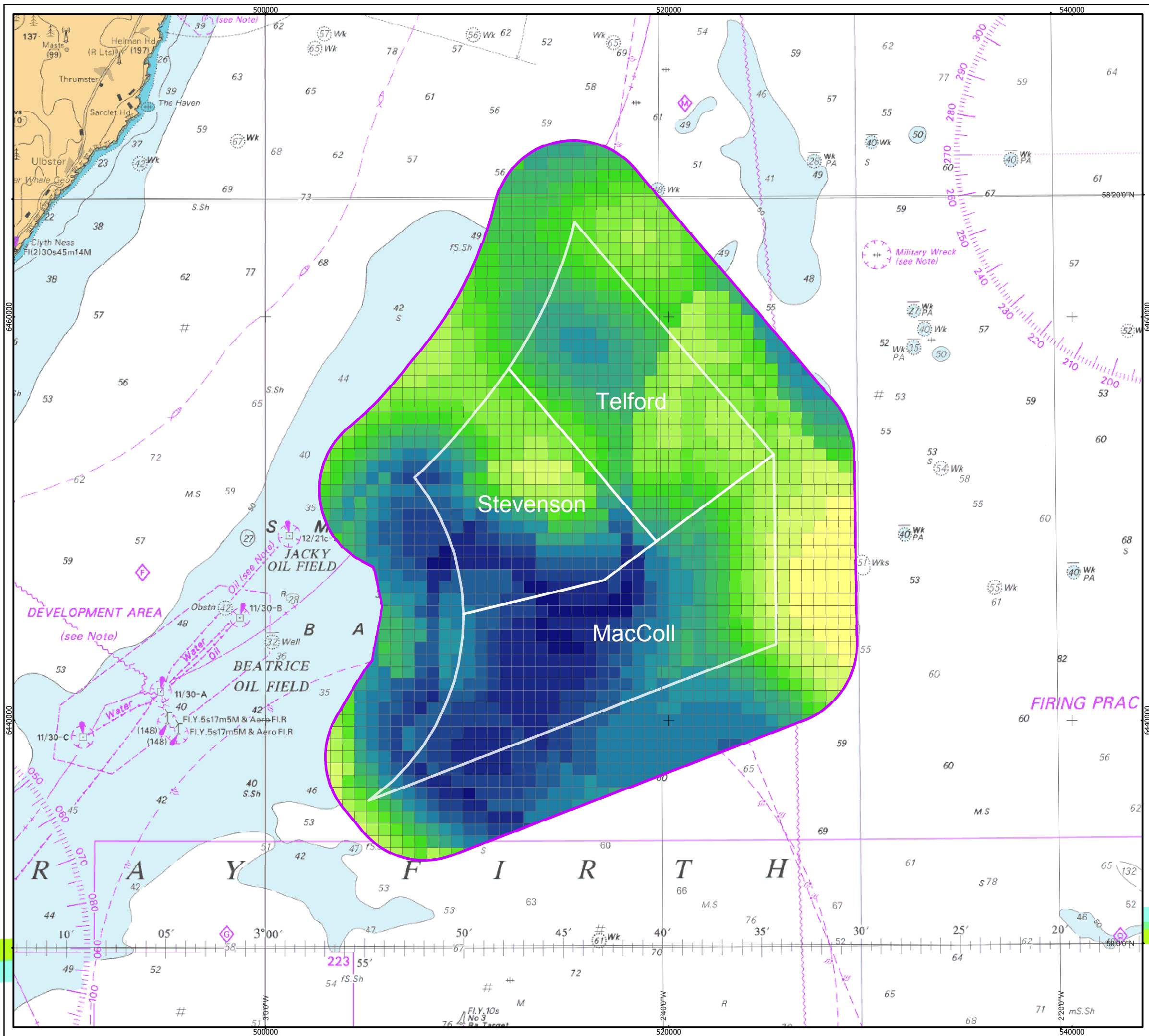
Produced: LG
Reviewed: CJP
Approved: CR

Date: 27/03/2012 Revision: B
REF: 8460001-PPW0200-NPW-MAP-008

Fig 4.5-5: Predicted Density of Guillemot using the Sea

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KEY

Boat-based survey area

Predicted razorbill density* (birds per 600m grid square)

	1.46 - 2.39
	2.39 - 3.20
	3.20 - 3.73
	3.73 - 4.09
	4.09 - 4.46
	4.46 - 4.83
	4.83 - 5.22
	5.22 - 5.72
	5.72 - 6.24
	6.24 - 6.82
	6.82 - 7.59
	7.59 - 8.52
	8.52 - 9.65
	9.65 - 11.22
	11.22 - 14.08

*Numbers based on data for August 2011

Horizontal Scale: 1:180,000 A3 Chart N

Geodetic Parameters: WGS84 UTM Zone 30N

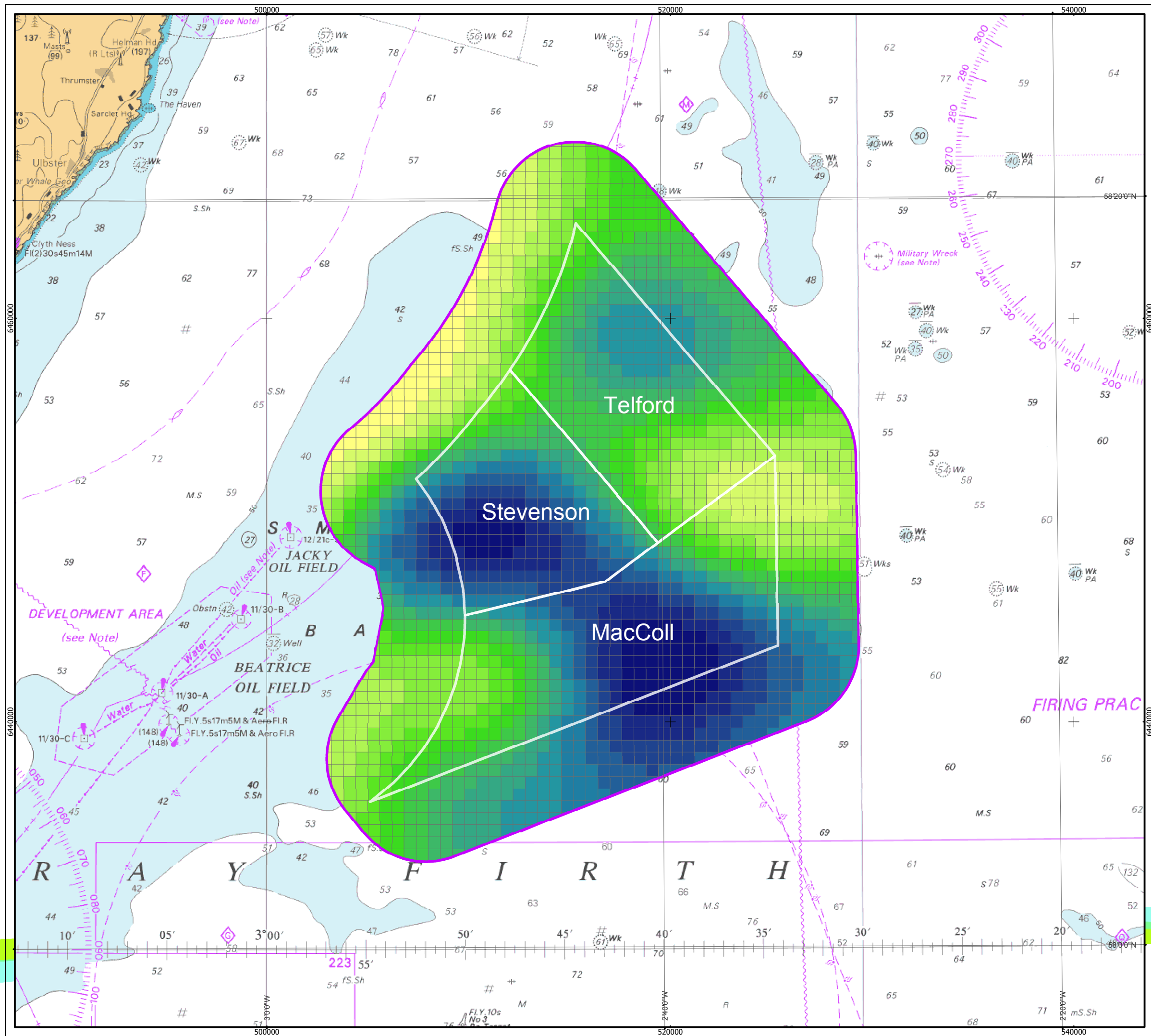
Produced: LG
 Reviewed: CJP
 Approved: CR

Date: 27/03/2012 Revision: B
 REF: 8460001-PPW0201-NPW-MAP-009

Fig 4.5-6: Predicted Density of Razorbill using the Sea

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KEY

Boat-based survey area

Predicted puffin density*
(birds per 600m grid square)

- 2.69 - 3.30
- 3.30 - 3.73
- 3.73 - 4.03
- 4.03 - 4.31
- 4.31 - 4.58
- 4.58 - 4.87
- 4.87 - 5.15
- 5.15 - 5.43
- 5.43 - 5.76
- 5.76 - 6.14
- 6.14 - 6.61
- 6.61 - 7.12
- 7.12 - 7.64
- 7.64 - 8.24
- 8.24 - 9.08

*Numbers based on data for August 2011

Horizontal Scale: 1:180,000 A3 Chart N

Geodetic Parameters: WGS84 UTM Zone 30N

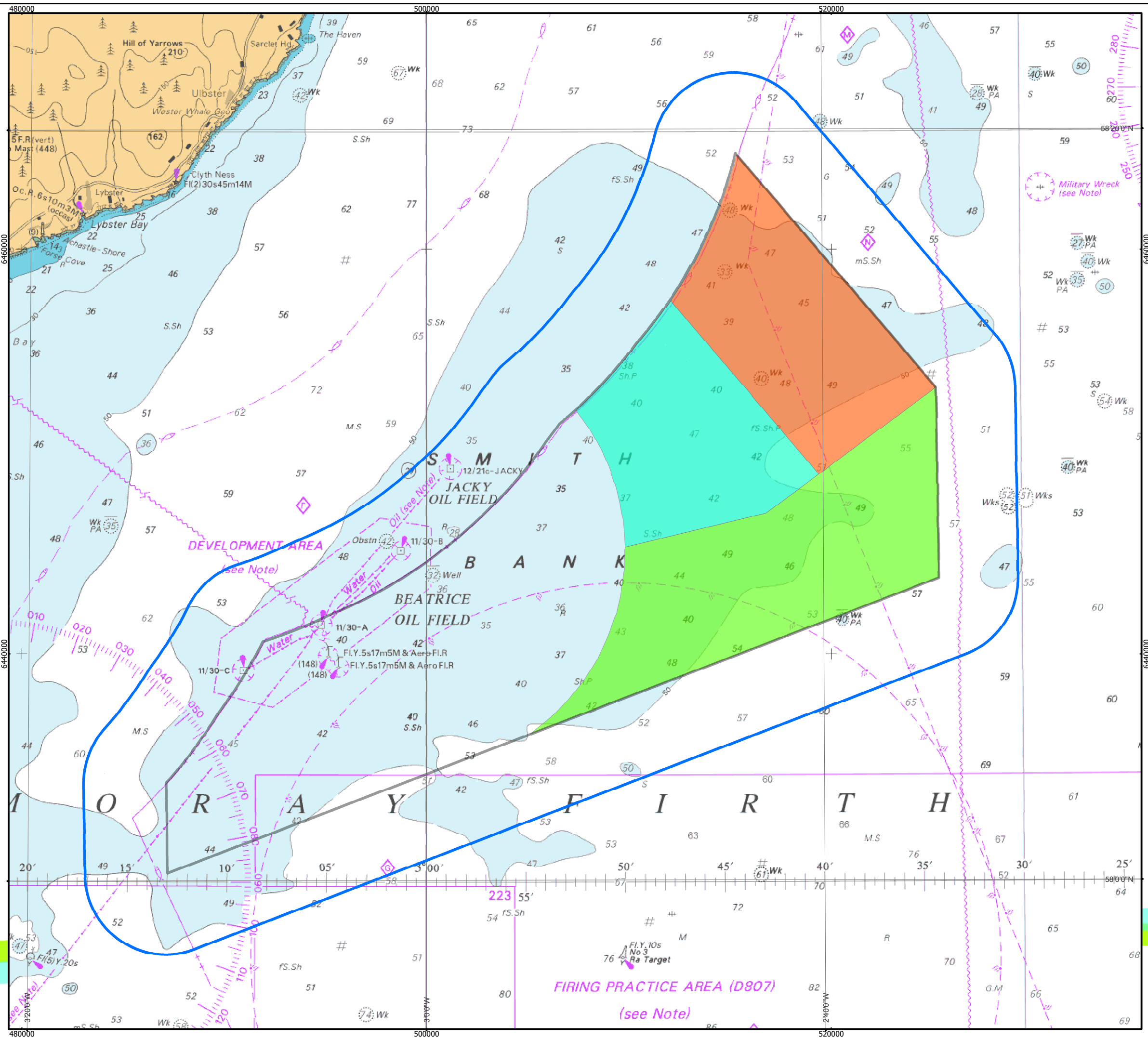
Produced: LG
 Reviewed: CJP
 Approved: CR

Date: 27/03/2012 Revision: B
 REF: 8460001-PPW0201-NPW-MAP-010

Fig 4.5-7: Predicted Density of Puffin using the Sea

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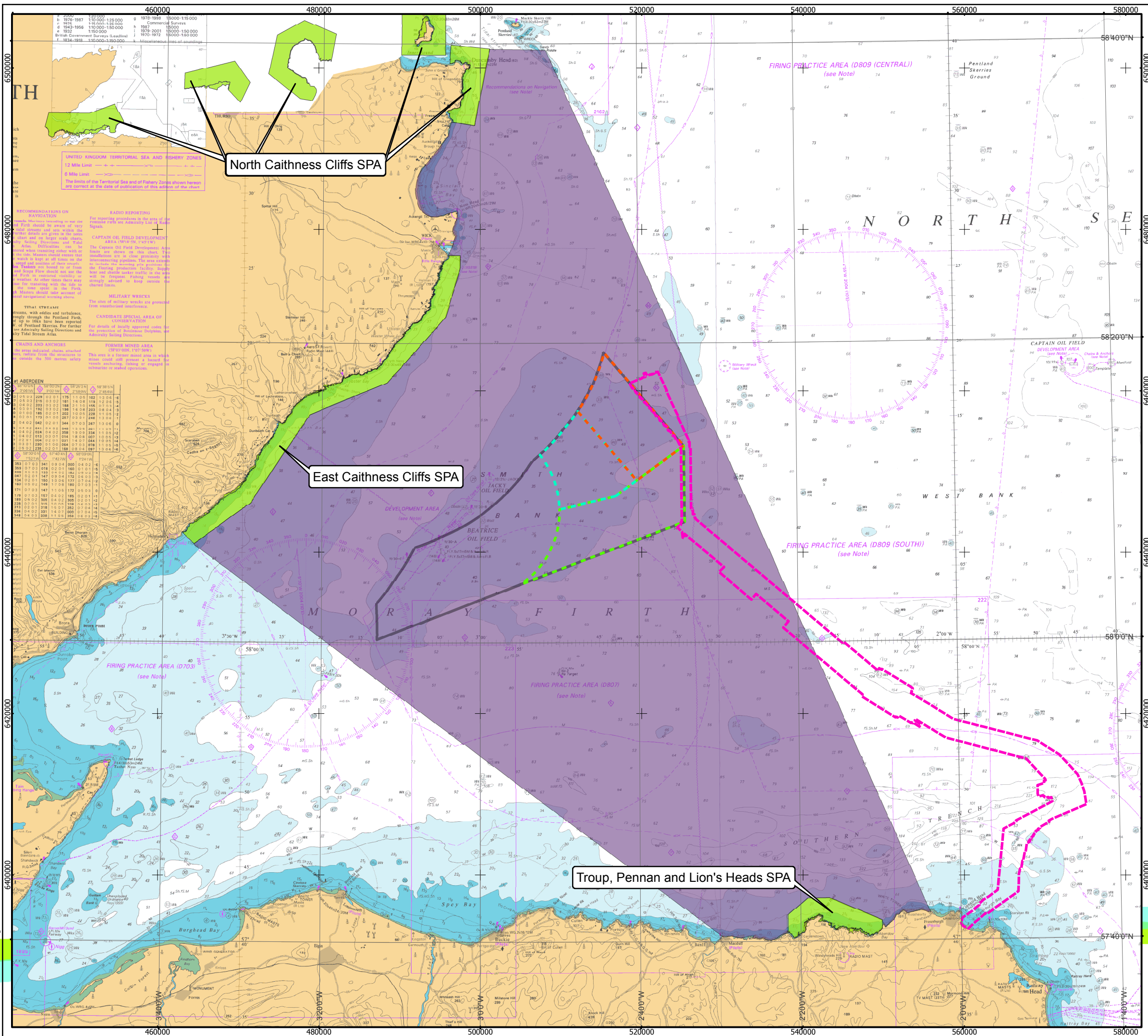
- KEY**
- Telford Windfarm
 - Stevenson Windfarm
 - MacColl Windfarm
 - MORL Zone Boundary
 - Aerial survey area

Horizontal Scale: 1:180,000		A3 Chart
Geodetic Parameters: WGS84 UTM Zone 30N		
Produced: LG		
Reviewed: CJP		
Approved: CR		
Date: 22/03/2012	Revision: B	
REF: 8460001-PPW0201-NPW-MAP-011		

Fig 4.5-8: Aerial Survey Area (2009 - 2010)

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Moray Offshore Renewables Ltd

KEY

- Telford Windfarm
- Stevenson Windfarm
- MacColl Windfarm
- MORL Zone Boundary
- Offshore Export Cable Route
- Aerial survey area
- Special Protection Areas

Horizontal Scale: 1:450,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

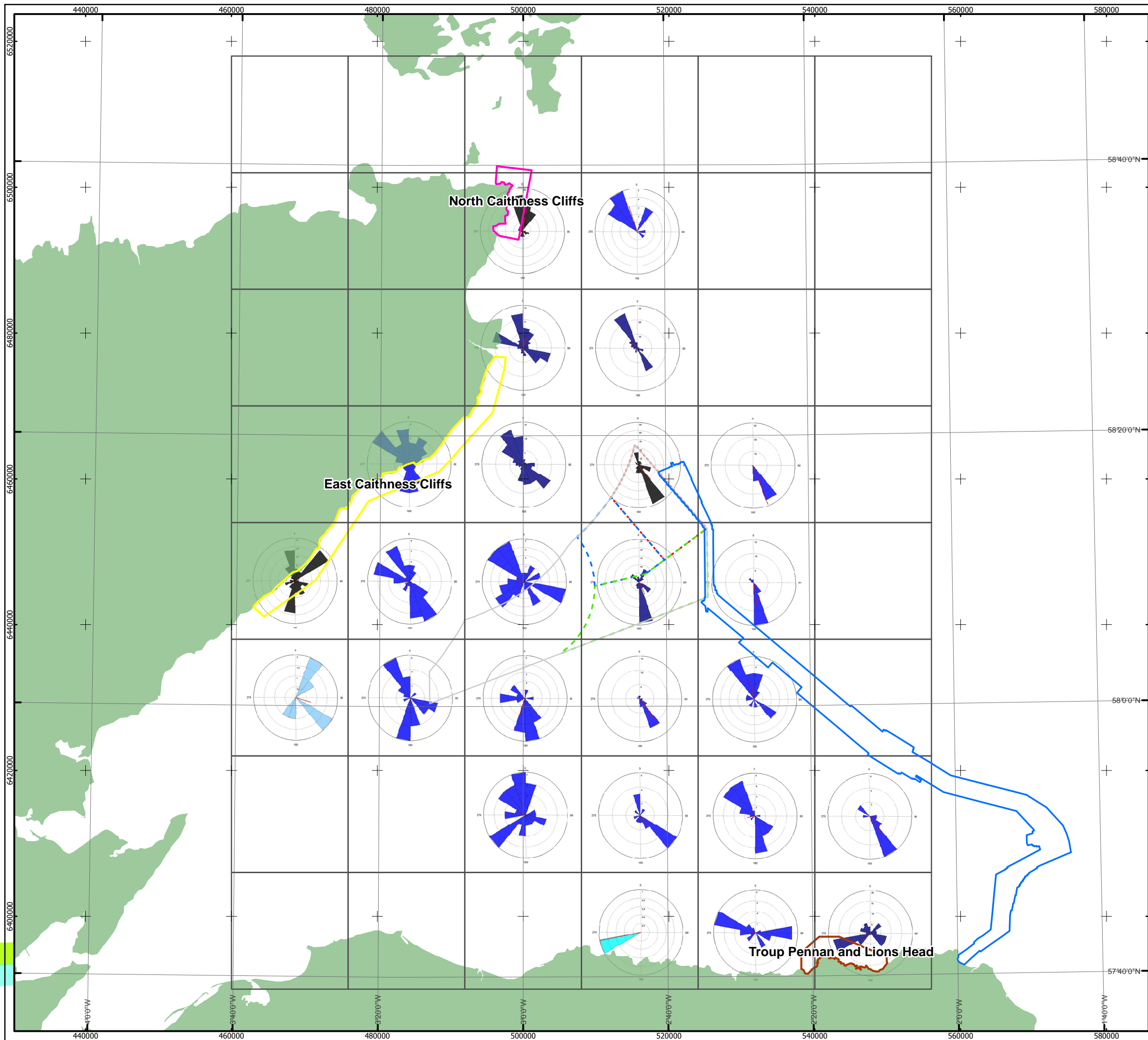
Produced: LG
 Reviewed: CJP
 Approved: CR

Date: 22/03/2012 Revision: B
 REF: 8460001-PPW0201-NPW-MAP-012

Fig 4.5-9: Aerial Survey Area (Summer 2011)

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KEY

- 1 bird
- 2-9 birds
- 10-49 birds
- 50-99 birds
- >100 birds
- OFTO Export Cable Route
- 16km grid
- Moray Offshore Windfarm Boundary
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Horizontal Scale: 1:500,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

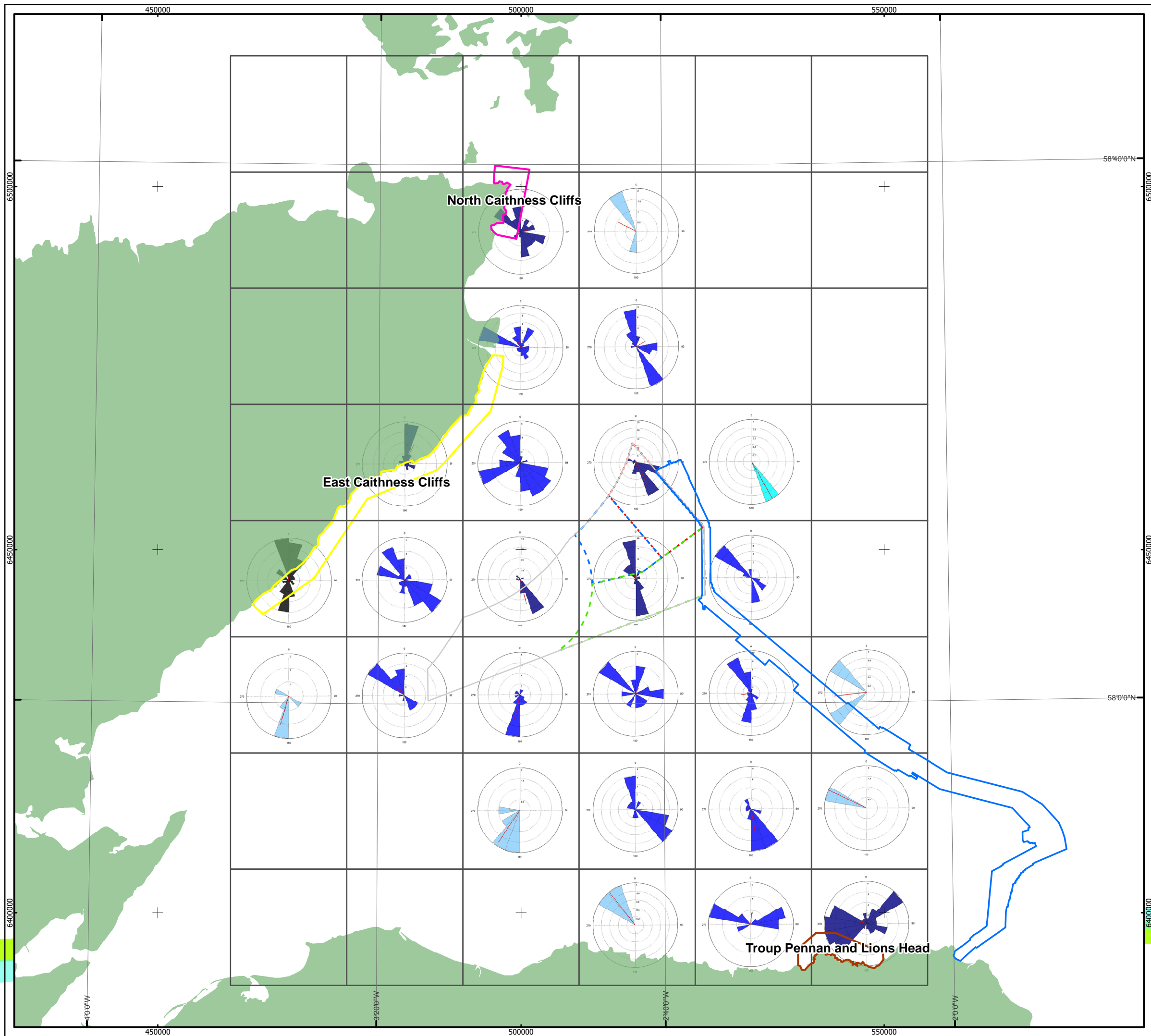
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-001

Fig 4.5-10 Guillemot Flight Directions from aerial surveys

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Moray Offshore Renewables Ltd

KEY

- 1 bird
- 2-9 birds
- 10-49 birds
- 50-99 birds
- >100 birds
- OFTO Export Cable Route
- 16km grid
- Moray Offshore Windfarm Boundary
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Horizontal Scale: 1:500,000 A3 Chart
N

Geodetic Parameters: WGS84 UTM Zone 30N

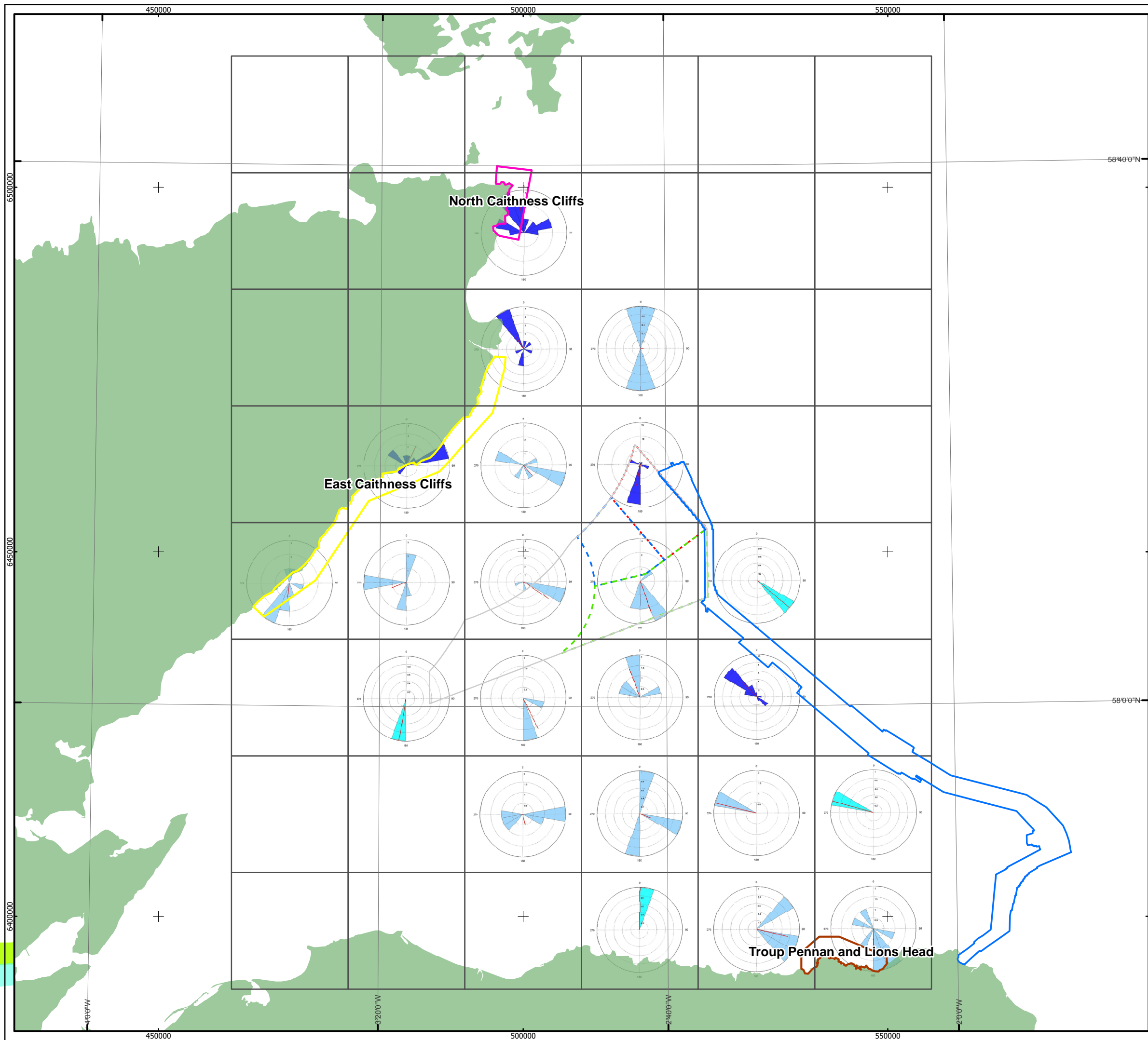
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-002

Fig 4.5-11 Razorbill Flight Directions from aerial surveys

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Moray Offshore Renewables Ltd

KEY

- 1 bird
- 2-9 birds
- 10-49 birds
- 50-99 birds
- >100 birds
- OFTO Export Cable Route
- 16km grid
- Moray Offshore Windfarm Boundary
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Horizontal Scale: 1:500,000 A3 Chart
N
↑

Geodetic Parameters: WGS84 UTM Zone 30N

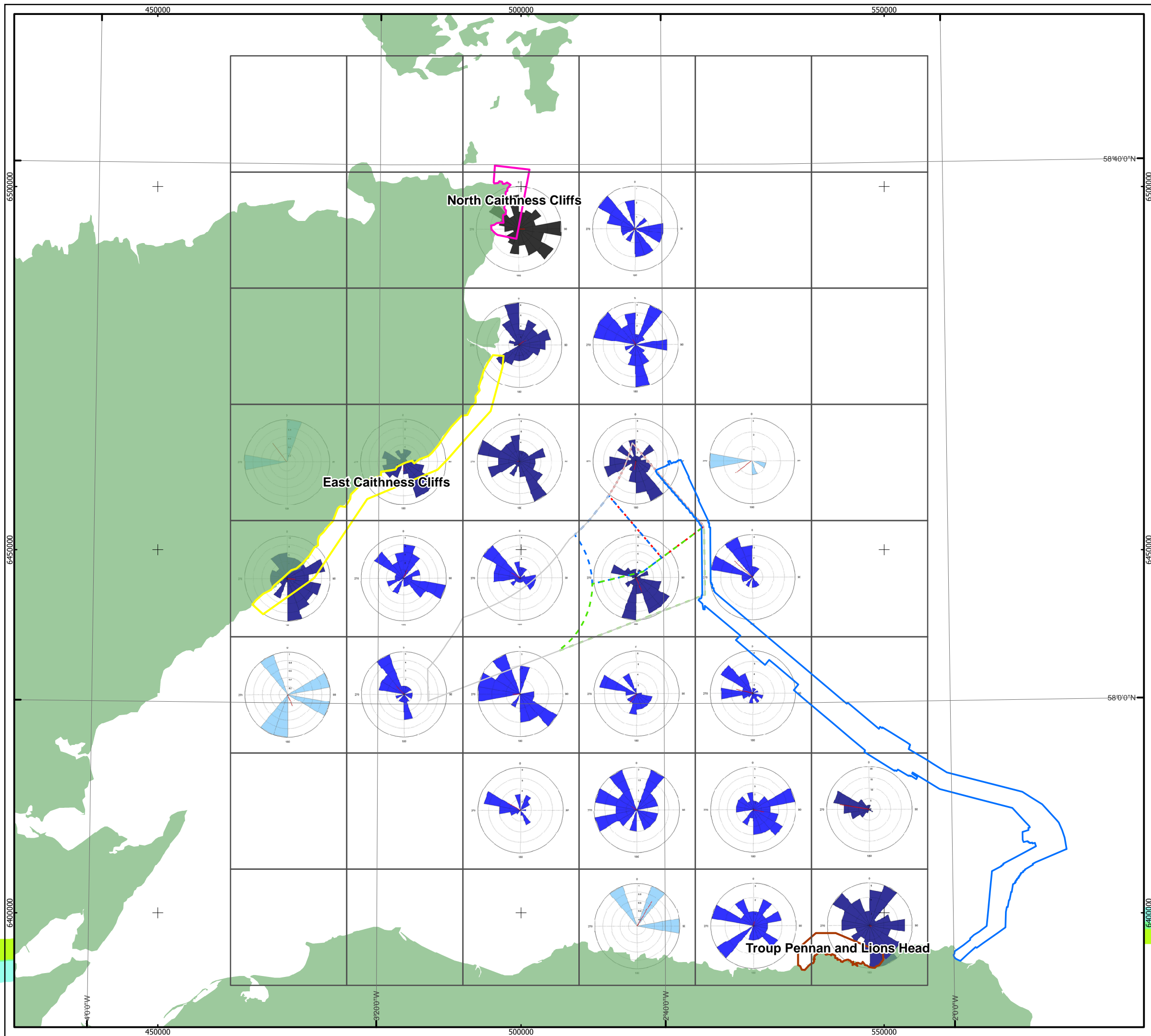
Produced: MH
Reviewed: KL
Approved: PH

Date: 04/05/2012 Revision: C
REF: 8460001-PPW0201-APE-MAP-003

**Fig 4.5-12 Puffin Flight
Directions from aerial surveys**

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Moray Offshore Renewables Ltd

KEY

- 1 bird
- 2-9 birds
- 10-49 birds
- 50-99 birds
- >100 birds
- OFTO Export Cable Route
- 16km grid
- Moray Offshore Windfarm Boundary
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Horizontal Scale: 1:500,000 A3 Chart
 0 12,500 25,000 Meters N

Geodetic Parameters: WGS84 UTM Zone 30N

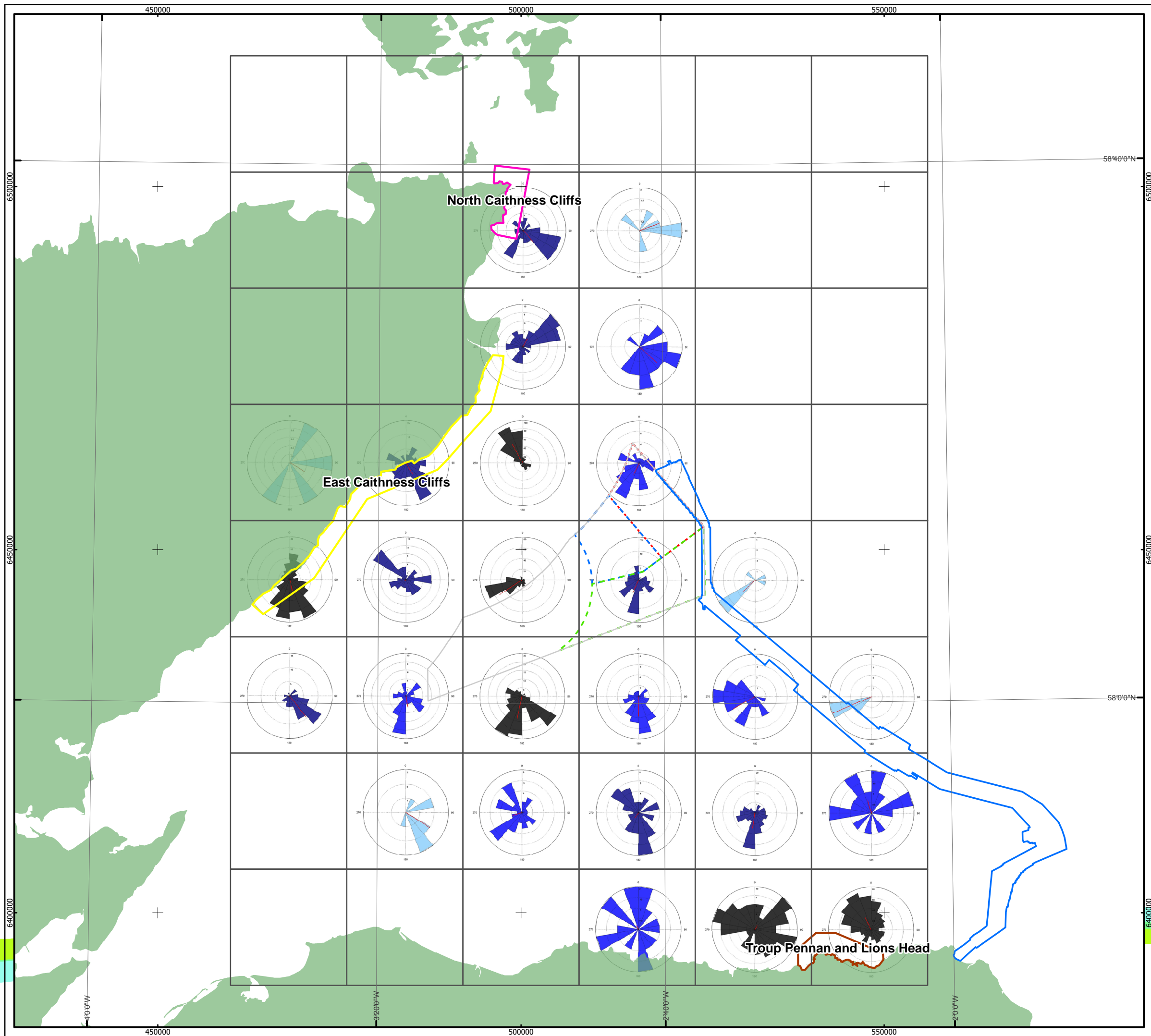
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-004

Fig 4.5-13 Fulmar Flight Directions from aerial surveys

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Moray Offshore Renewables Ltd

KEY

- 1 bird
- 2-9 birds
- 10-49 birds
- 50-99 birds
- >100 birds
- OFTO Export Cable Route
- 16km grid
- Moray Offshore Windfarm Boundary
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Horizontal Scale: 1:500,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

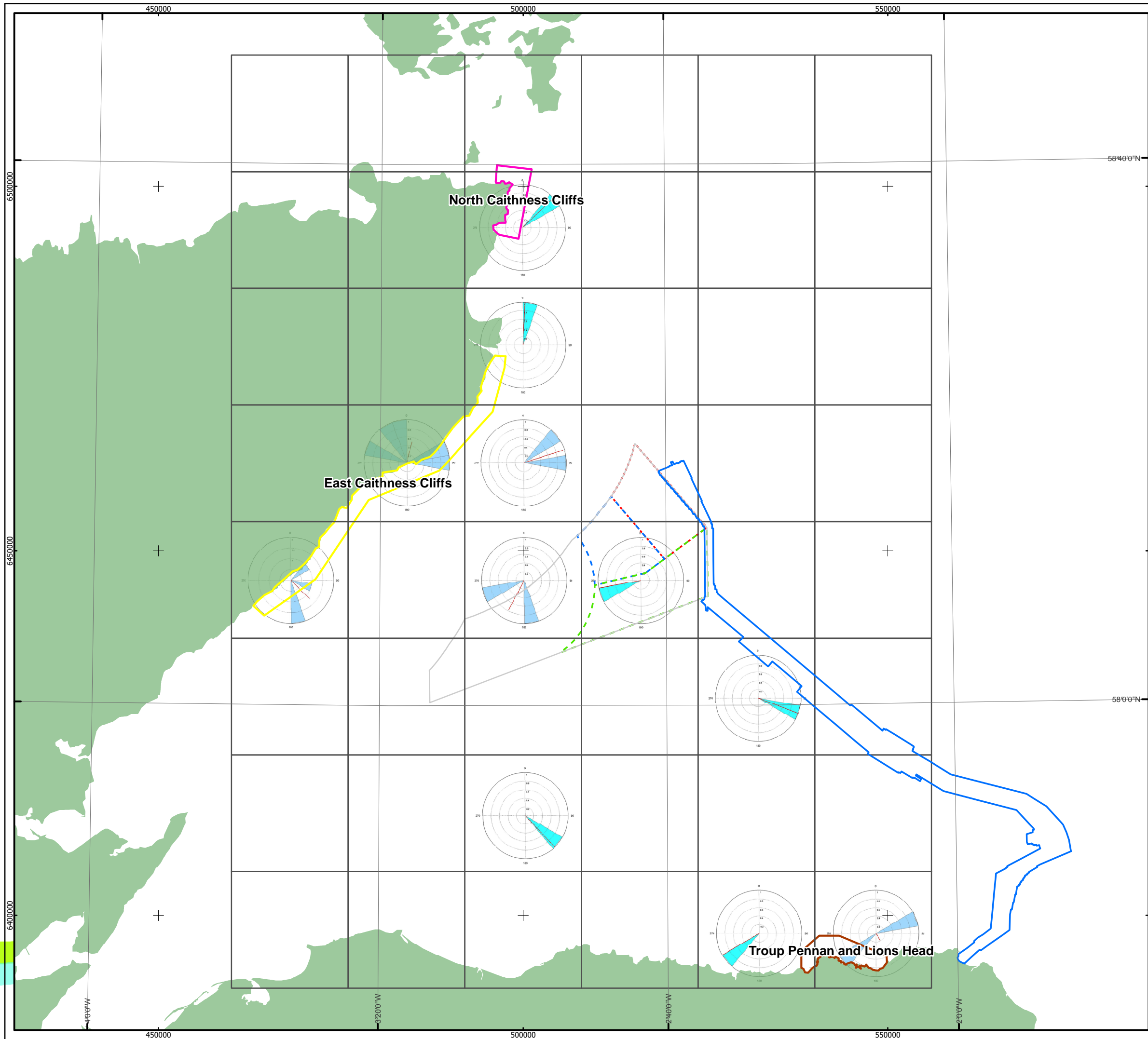
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-005

Fig 4.5-14 Kittiwake Flight Directions from aerial surveys

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Moray Offshore Renewables Ltd

KEY

- 1 bird
- 2-9 birds
- 10-49 birds
- 50-99 birds
- >100 birds
- OFTO Export Cable Route
- 16km grid
- Moray Offshore Windfarm Boundary
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Horizontal Scale: 1:500,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

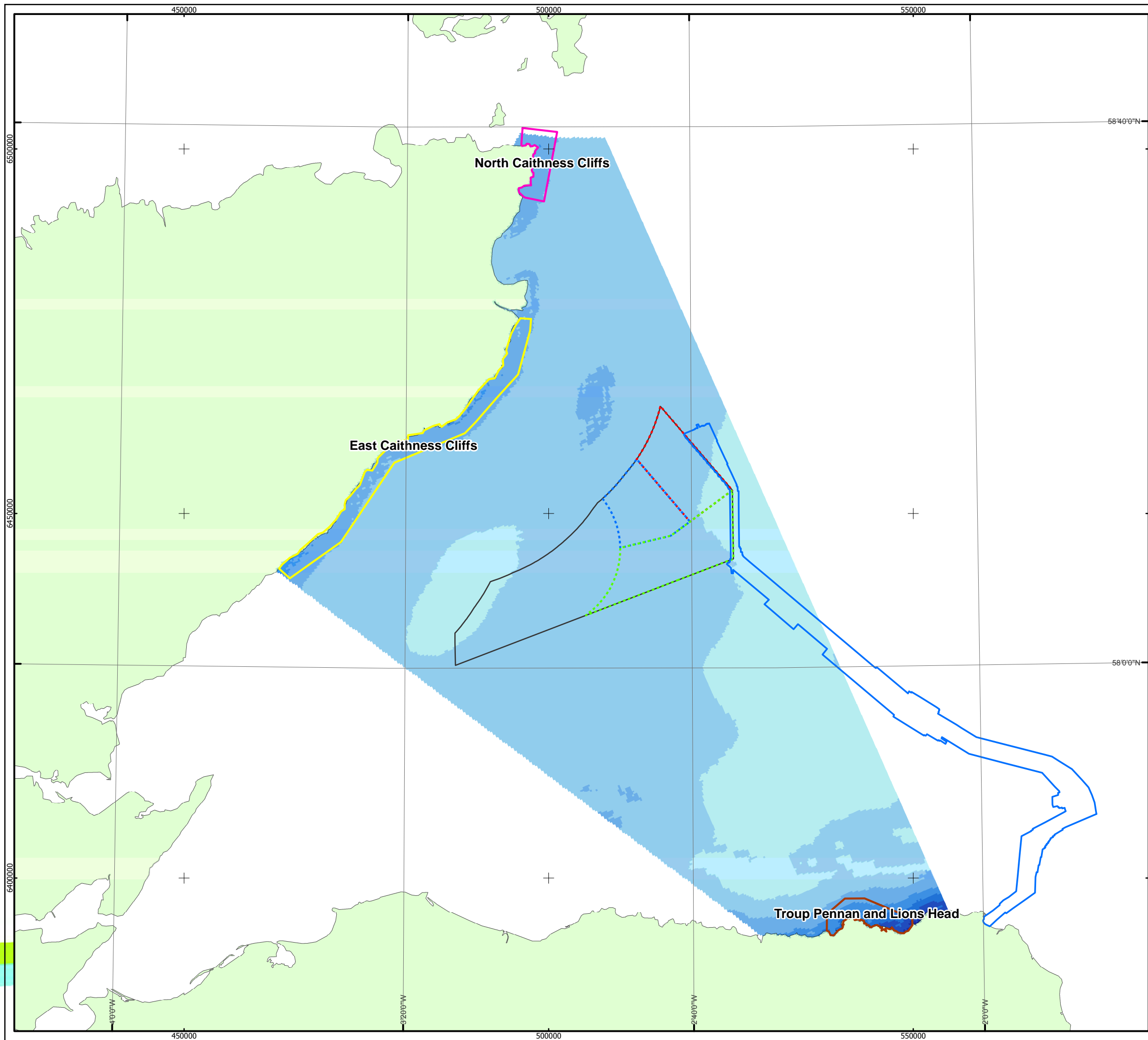
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-006

**Fig 4.5-15 Great black
 -backed gull Flight
 Directions from aerial surveys**

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Moray Offshore Renewables Ltd

KEY

- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- MORL Zone Boundary
- OFTO Export Cable Route
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Guillemot Density per 250m2

- 0.00 - 0.46
- 0.47 - 1.76
- 1.77 - 4.31
- 4.32 - 8.10
- 8.11 - 14.02
- 14.03 - 22.36
- 22.37 - 34.44
- 34.45 - 49.50

Horizontal Scale: 1:500,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

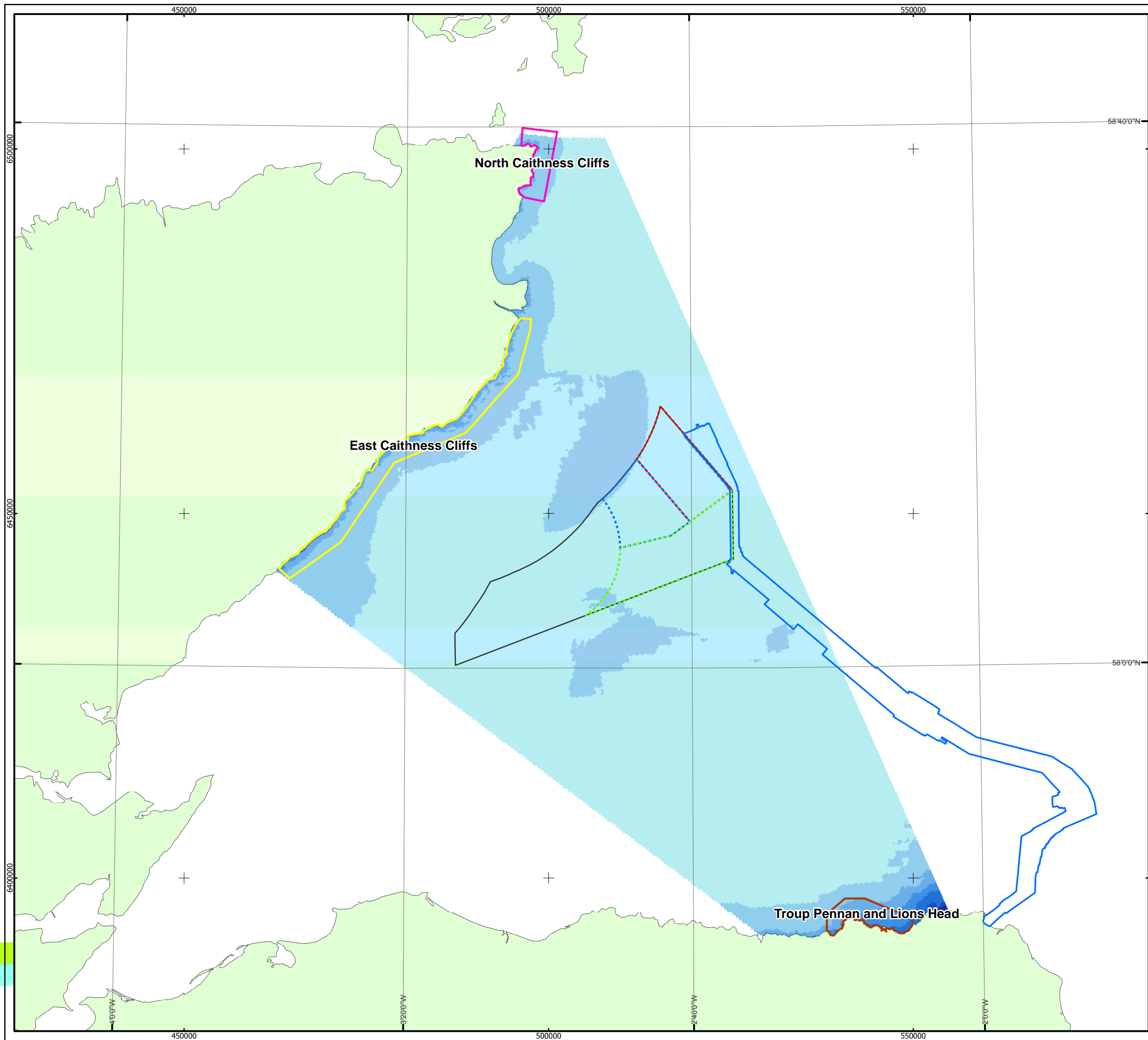
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-007

Fig 4.5-16 Density surface model outputs for guillemots from all surveys

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KEY

- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- Moray Offshore Windfarm Boundary
- OFTO Export Cable Route
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Razorbill Density per 250m2

- 0.00 - 0.88
- 0.89 - 3.07
- 3.08 - 6.82
- 6.83 - 13.63
- 13.64 - 27.12
- 27.13 - 55.56
- 55.57 - 169.19
- 169.20 - 286.77

Horizontal Scale: 1:500,000 A3 Chart
 0 12,500 25,000 Meters

Geodetic Parameters: WGS84 UTM Zone 30N

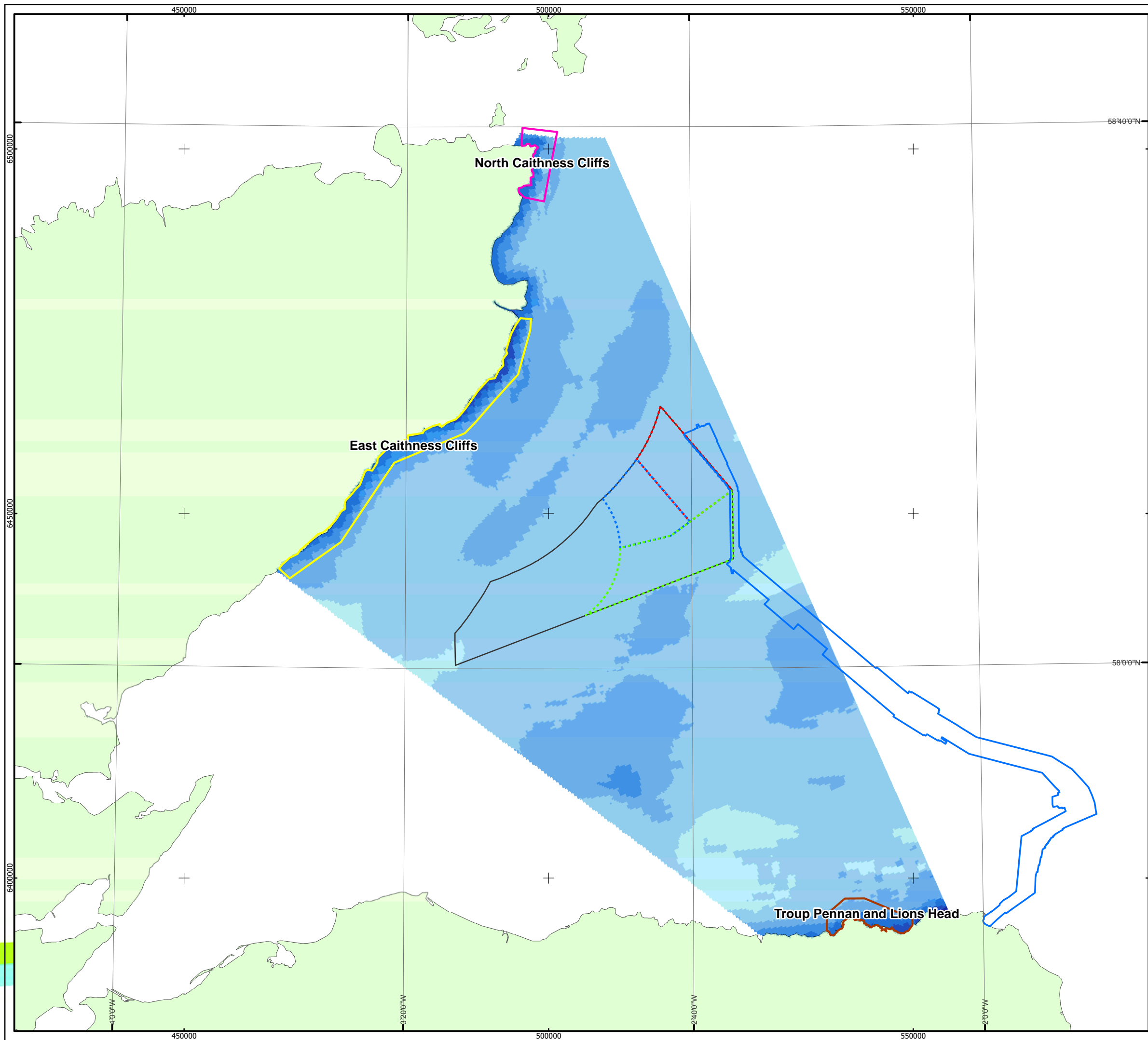
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-008

Fig 4.5-17 Density surface model outputs for razorbills from all surveys

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Moray Offshore Renewables Ltd

KEY

- OFTO Export Cable Route
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- MORL Zone Boundary
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Puffin Density per 250m2

- 0.00 - 0.05
- 0.06 - 0.17
- 0.18 - 0.39
- 0.40 - 0.70
- 0.71 - 1.32
- 1.33 - 2.46
- 2.47 - 4.43
- 4.44 - 9.74

Horizontal Scale: 1:500,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

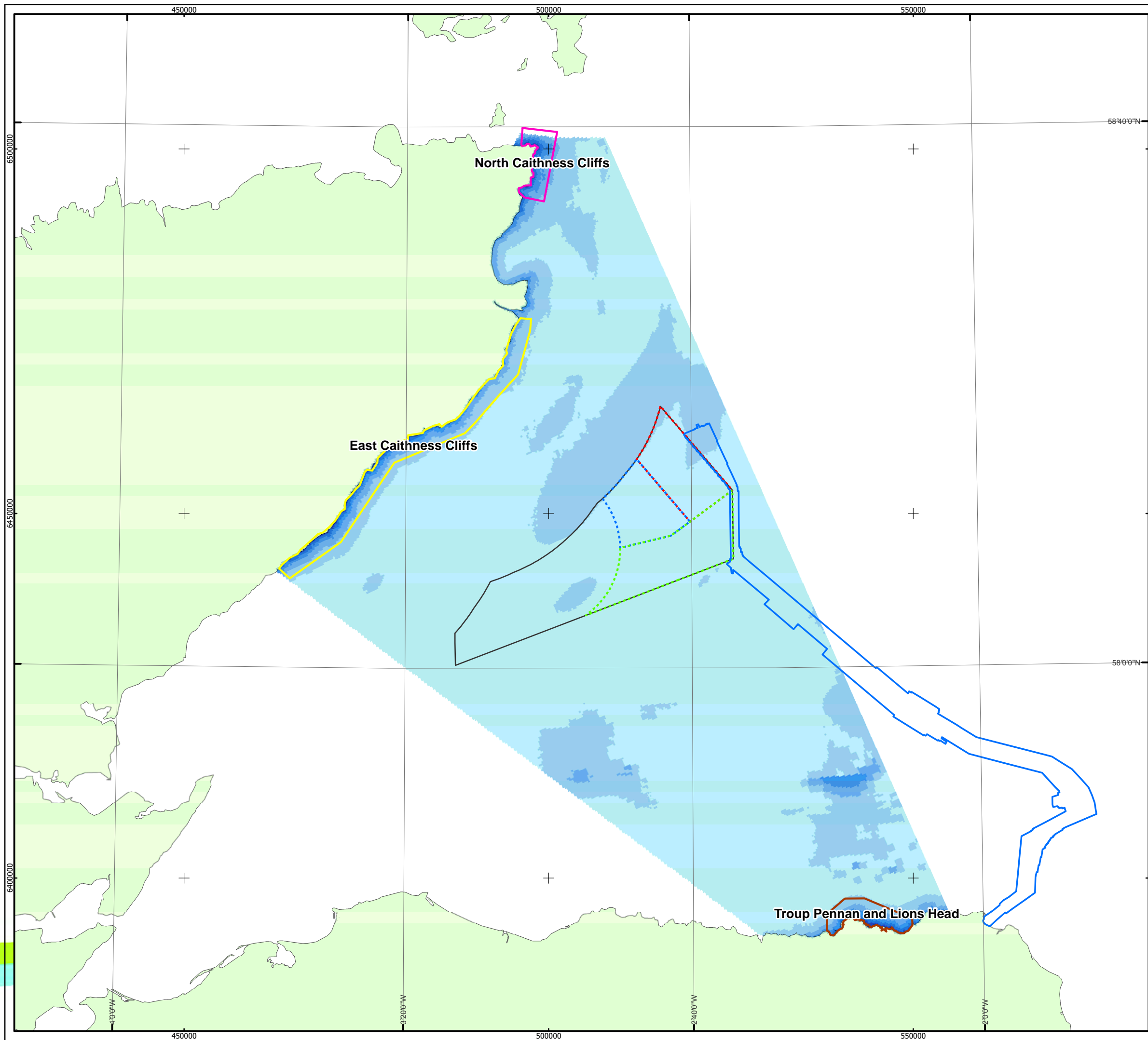
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-009

Fig 4.5-18 Density surface model outputs for puffins from all surveys

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Moray Offshore Renewables Ltd

KEY

- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- MORL Zone Boundary
- OFTO Export Cable Route
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Fulmar Density per 250m²

- 0.00 - 0.28
- 0.29 - 0.94
- 0.95 - 1.90
- 1.91 - 3.23
- 3.24 - 5.05
- 5.06 - 7.65
- 7.66 - 11.30
- 11.31 - 19.60

Horizontal Scale: 1:500,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

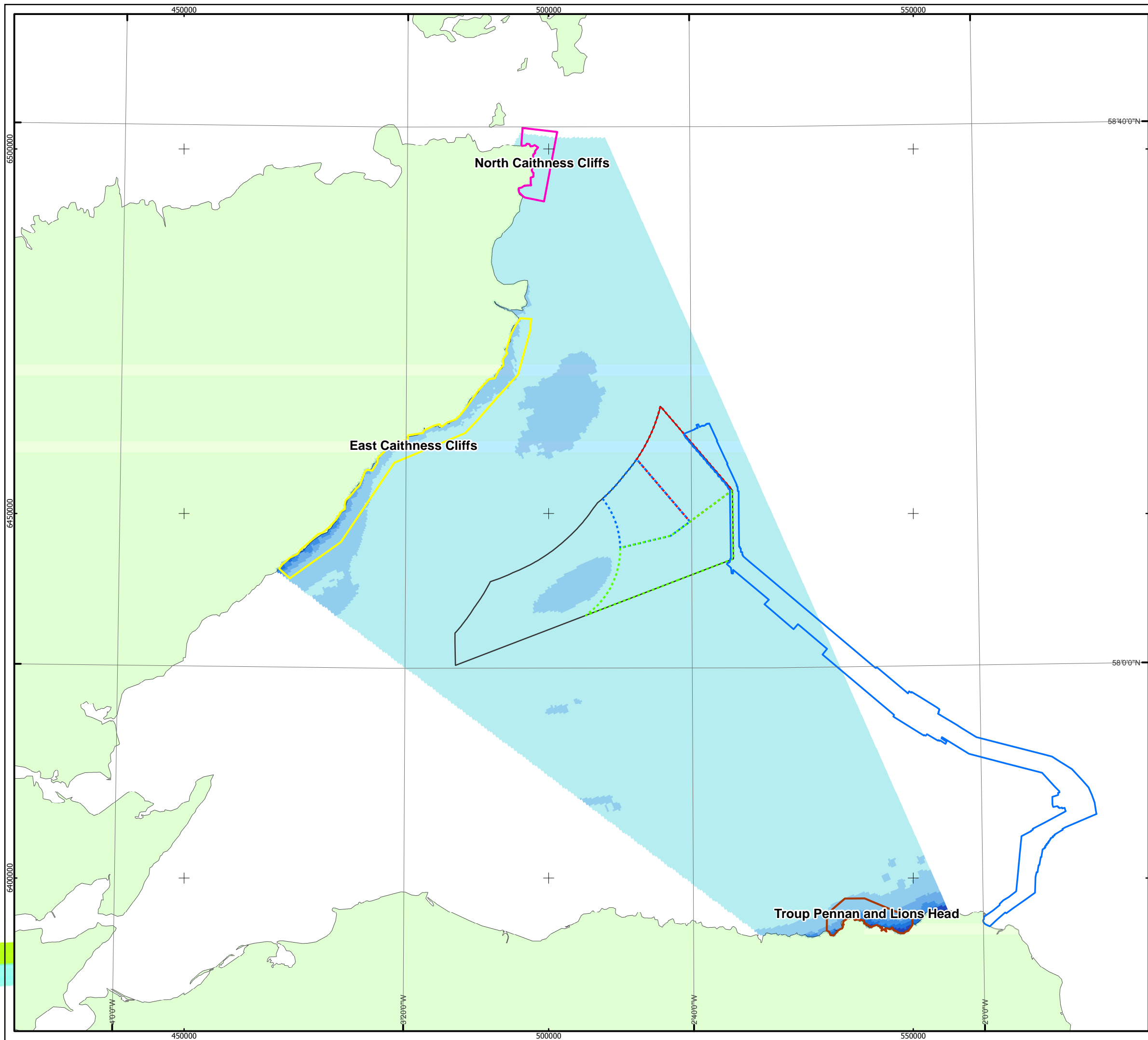
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-010

Fig 4.5-19 Density surface model outputs for fulmars from all surveys

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Moray Offshore Renewables Ltd

KEY

- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- MORL Zone Boundary
- OFTO Export Cable Route
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Kittiwake Density per 250m2

- 0.00 - 1.23
- 1.24 - 5.21
- 5.22 - 12.32
- 12.33 - 22.70
- 22.71 - 40.34
- 40.35 - 67.16
- 67.17 - 108.48
- 108.49 - 176.41

Horizontal Scale: 1:500,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

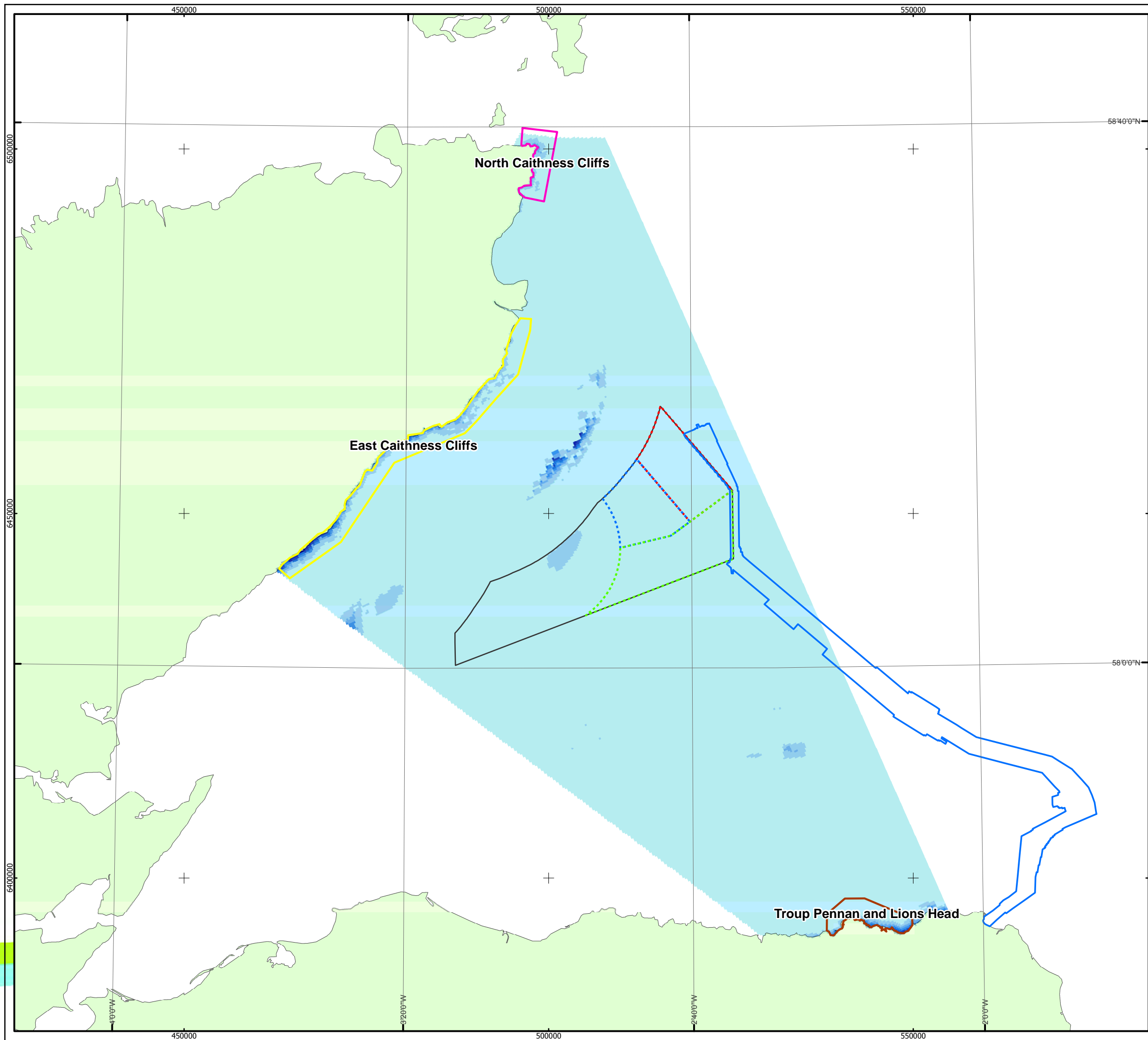
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-011

Fig 4.5-20 Density surface model outputs for kittiwakes from all surveys

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KEY

- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm
- MORL Zone Boundary
- OFTO Export Cable Route
- East Caithness Cliffs
- North Caithness Cliffs
- Troup Pennan and Lions Head

Great Black Backed Gull Density per 250m2

- 0.00 - 0.07
- 0.08 - 0.23
- 0.24 - 0.44
- 0.45 - 0.71
- 0.72 - 1.12
- 1.13 - 1.74
- 1.75 - 3.12
- 3.13 - 5.05

Horizontal Scale: 1:500,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

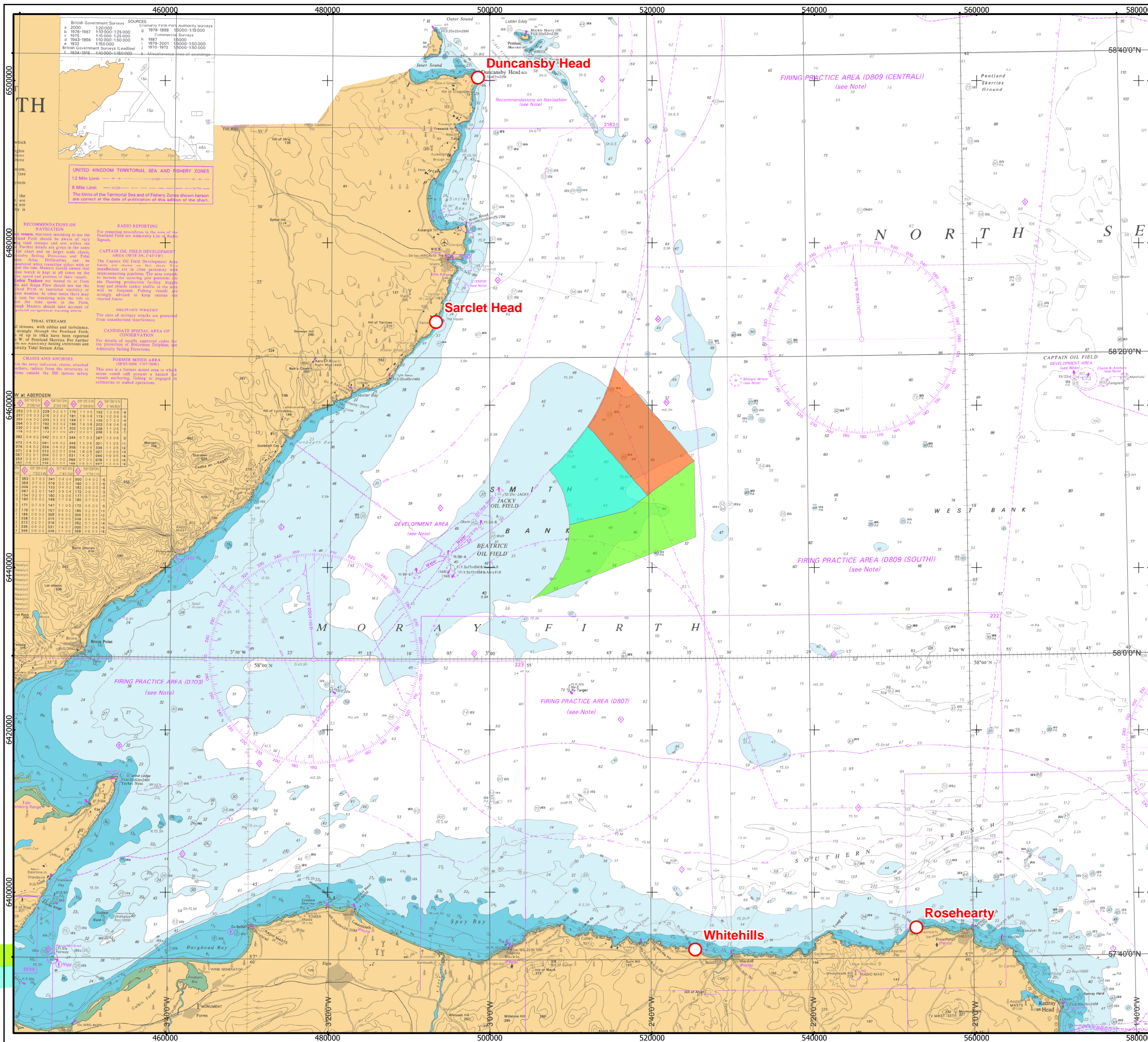
Produced: MH
 Reviewed: KL
 Approved: PH

Date: 04/05/2012 Revision: C
 REF: 8460001-PPW0201-APE-MAP-012

Fig 4.5-21 Density surface model outputs for great black backed gulls from all surveys

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KEY

- Telford Windfarm
- Stevenson Windfarm
- MacColl Windfarm
- Vantage point location

Horizontal Scale: 1:450,000 A3 Chart

Geodetic Parameters: WGS84 UTM Zone 30N

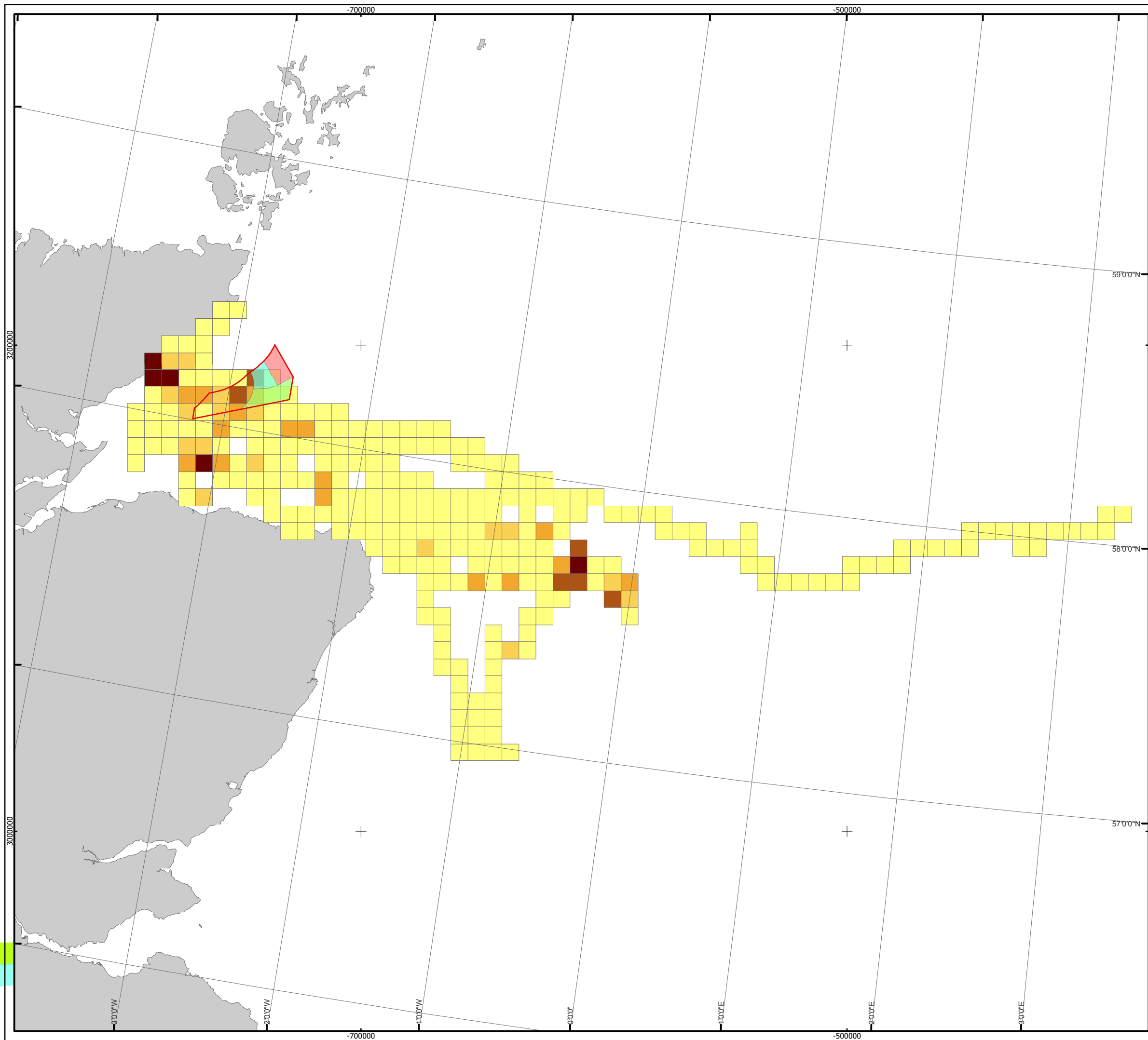
Produced: LG
 Reviewed: CJP
 Approved: CR

Date: 22/03/2012 Revision: B
 REF: 8460001-PPW0201-NPW-MAP-013

Fig 4.5-22: Coastal Migration Survey Locations



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KEY

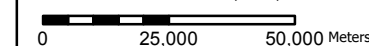
-  MORL Zone Boundary
-  MacColl Windfarm
-  Stevenson Windfarm
-  Telford Windfarm

No of Fulmar track fixes in 7km grid

-  1 - 50
-  51 - 100
-  101 - 200
-  201 - 300
-  >300

Horizontal Scale: 1:1,500,000

A3 Chart



Geodetic Parameters: Europe Albers Equal Area

Produced: JG
Reviewed: PH
Approved: CR

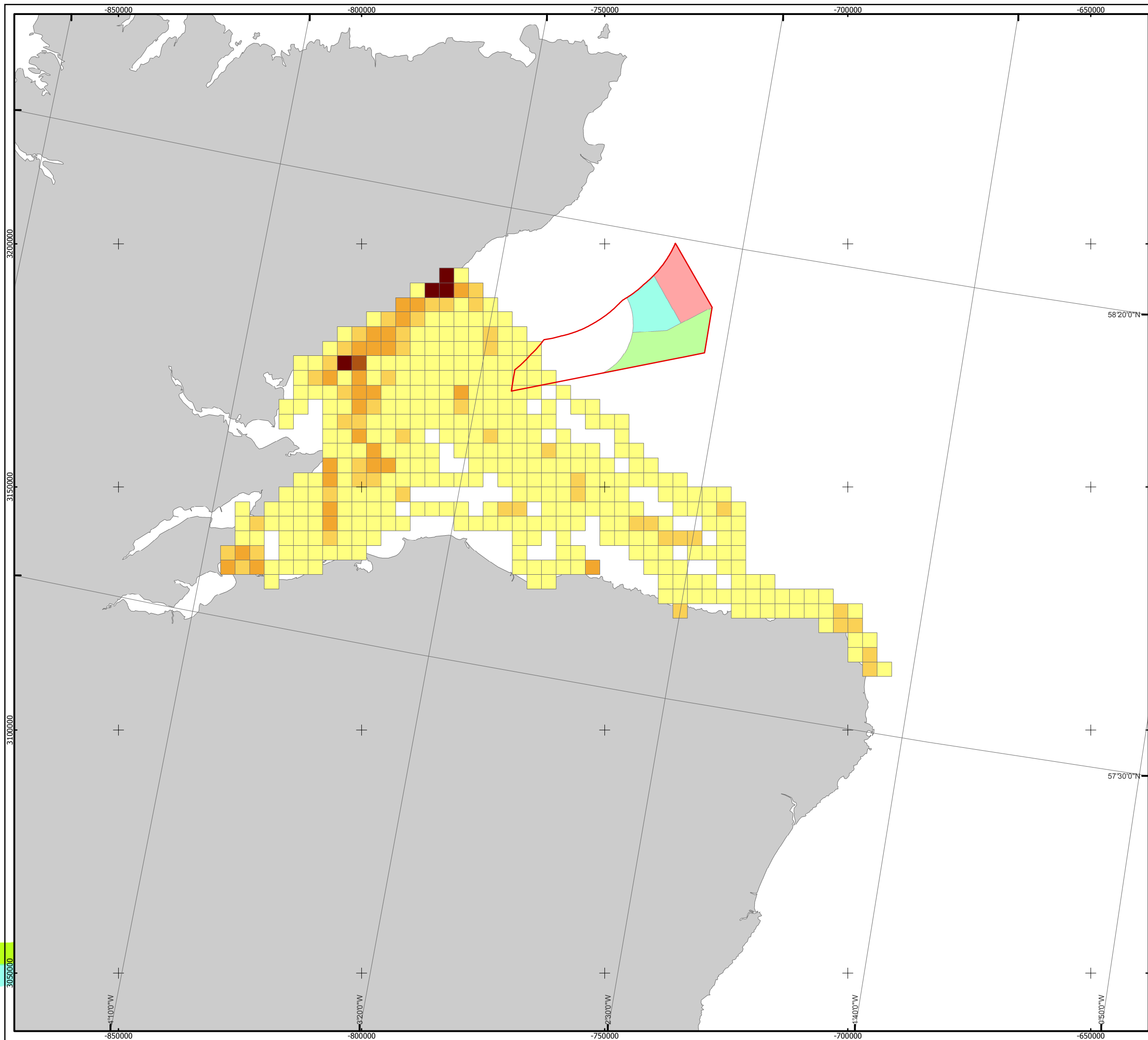
Date: 14/05/2012 Revision: B

REF: 8460001-PPW0201-UOP-MAP-001

Fig 4.5-23 Seabird Tracking Study Summary - Fulmars

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KEY

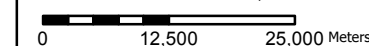
- MORL Zone Boundary
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm

No of Kittiwake track fixes 3km grid

- 1 - 50
- 51 - 100
- 101 - 200
- 201 - 300
- >300

Horizontal Scale: 1:750,000

A3 Chart



Geodetic Parameters: Europe Albers Equal Area

Produced: JG
Reviewed: PH
Approved: CR

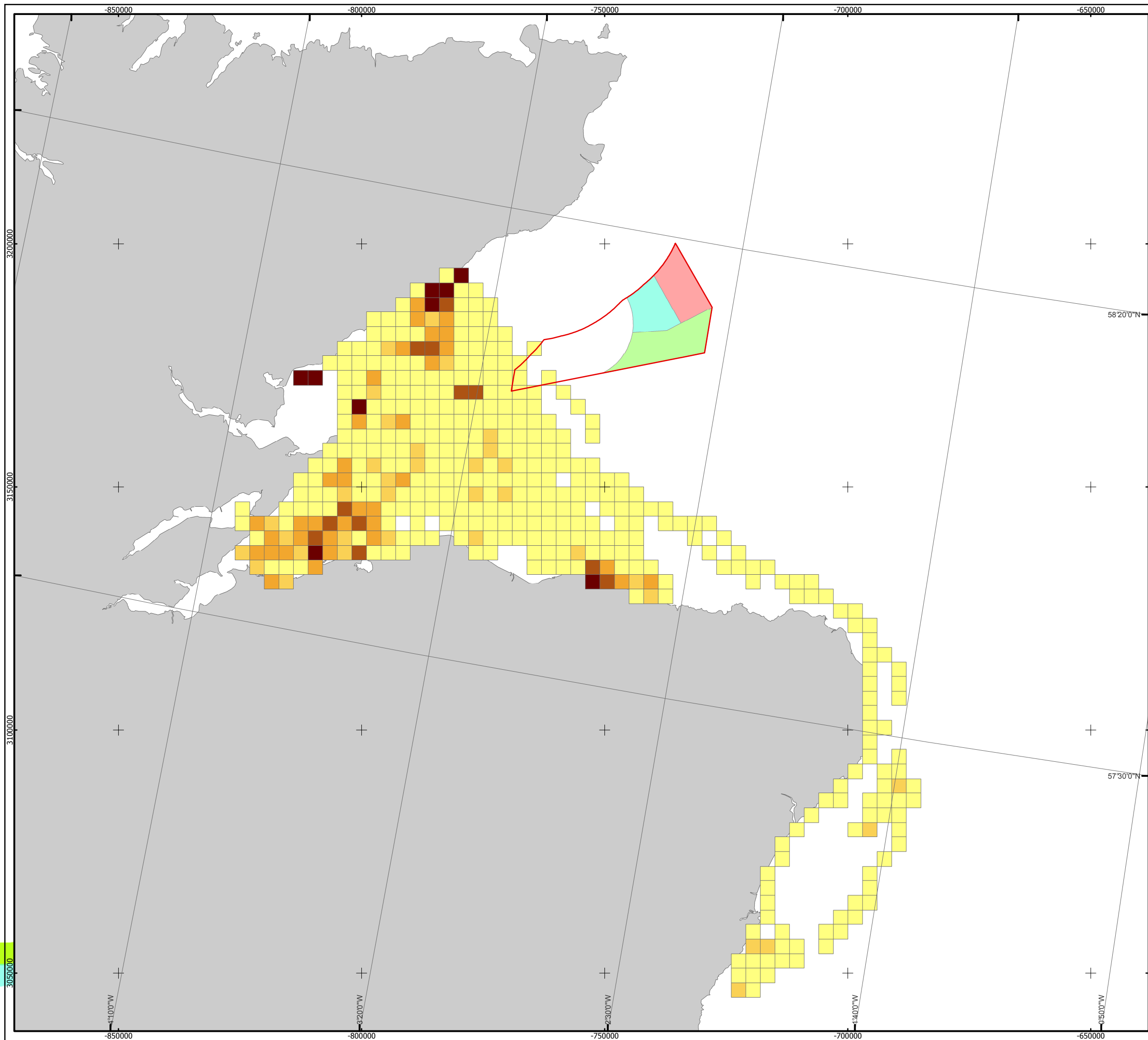
Date: 14/05/2012 Revision: B

REF: 8460001-PPW0201-UOP-MAP-002

Fig 4.5-24 Seabird Tracking Study Summary - Kittiwakes

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KEY

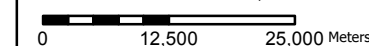
- MORL Zone Boundary
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm

No of Guillemot track fixes 3km grid

- 1 - 50
- 51 - 100
- 101 - 200
- 201 - 300
- 301 - 16812

Horizontal Scale: 1:750,000

A3 Chart



Geodetic Parameters: Europe Albers Equal Area

Produced: JG
Reviewed: PH
Approved: CR

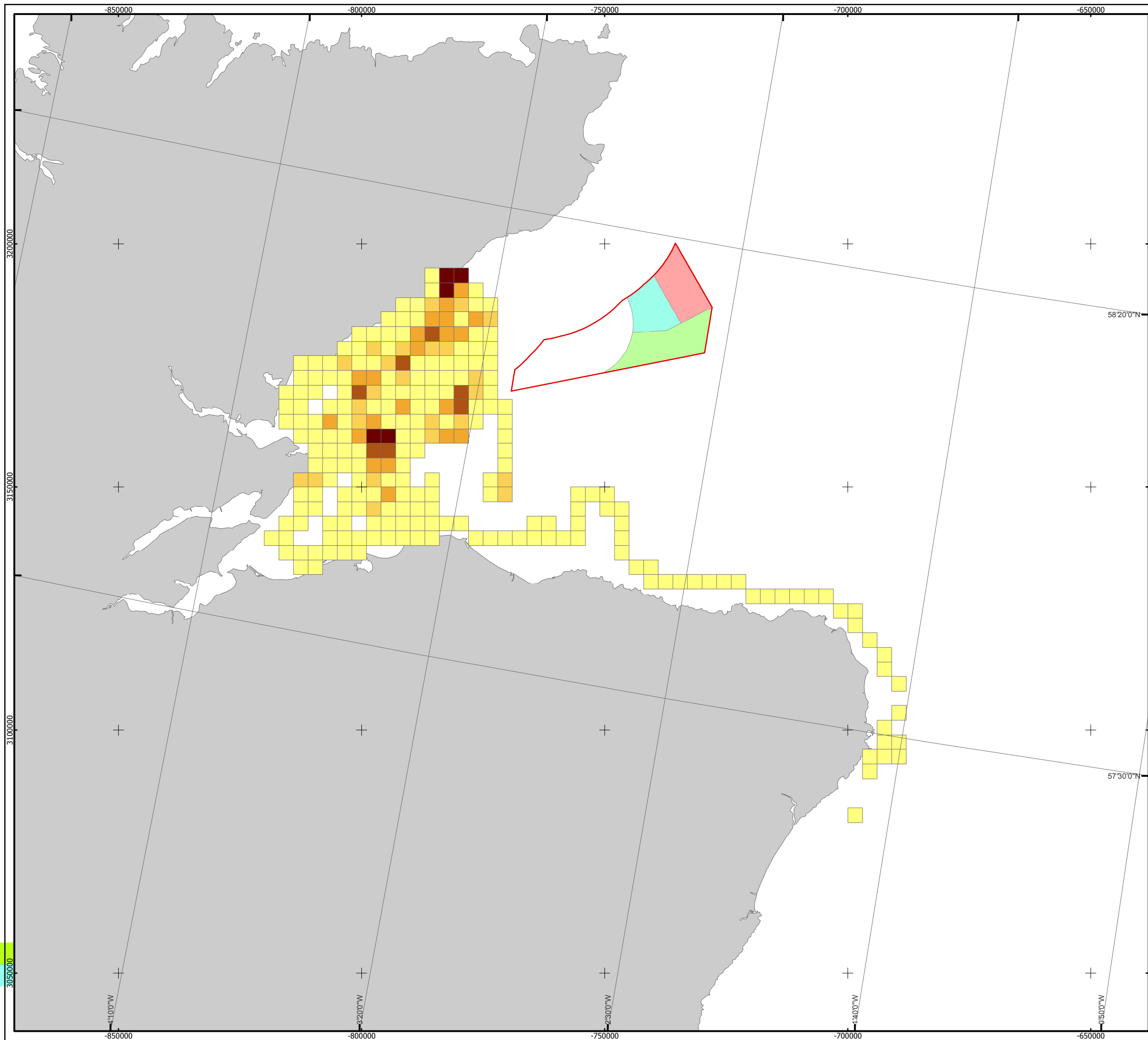
Date: 14/05/2012 Revision: B

REF: 8460001-PPW0201-UOP-MAP-003

Fig 4.5-25 Seabird Tracking Study Summary - Guillemots

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KEY

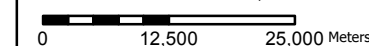
- MORL Zone Boundary
- MacColl Windfarm
- Stevenson Windfarm
- Telford Windfarm

No of Razorbill track fixes 3km grid

- 1 - 50
- 51 - 100
- 101 - 200
- 201 - 300
- 301 - 8850

Horizontal Scale: 1:750,000

A3 Chart



Geodetic Parameters: Europe Albers Equal Area

Produced: JG
Reviewed: PH
Approved: CR

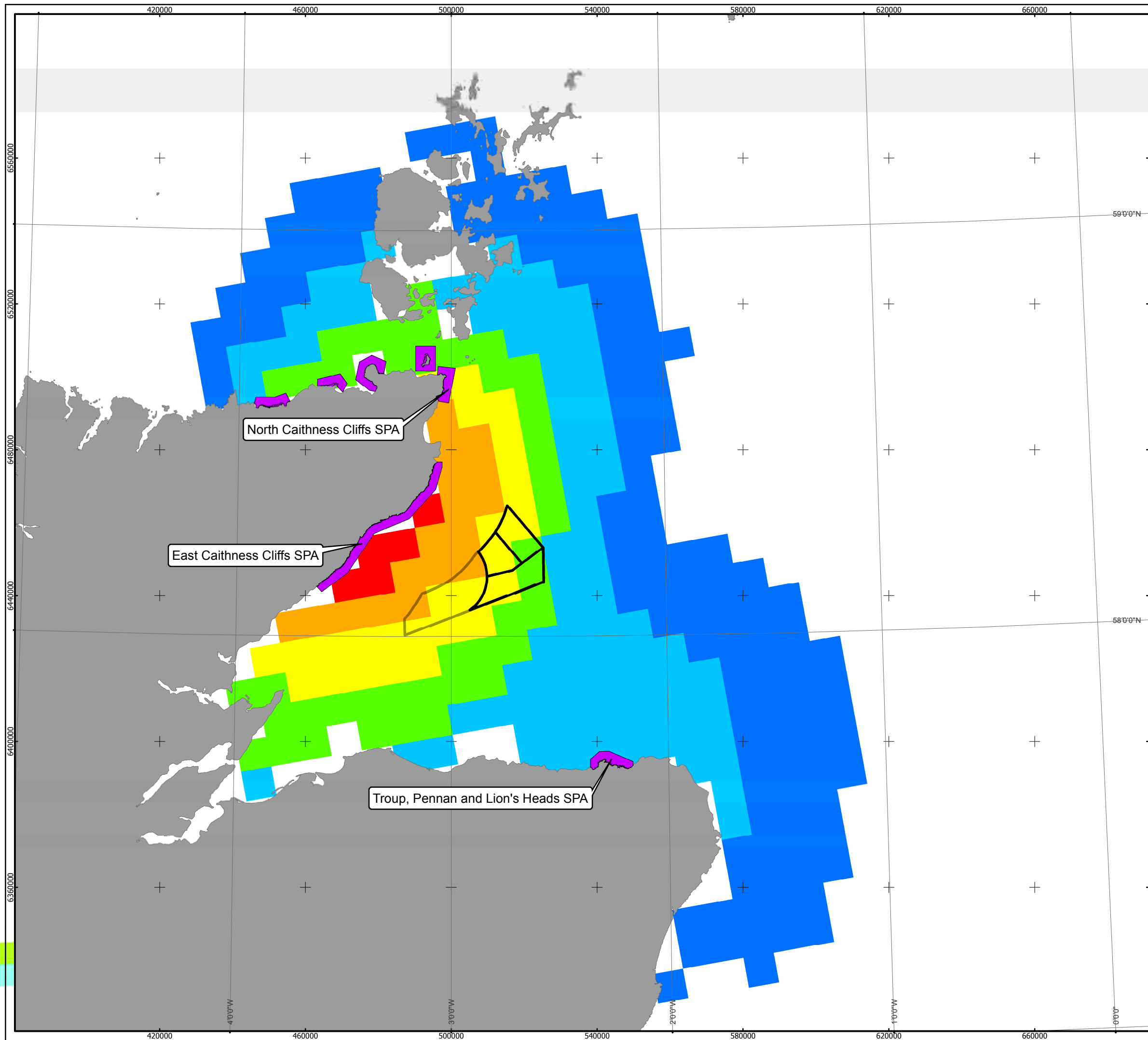
Date: 14/05/2012 Revision: B

REF: 8460001-PPW0201-UOP-MAP-004

Fig 4.5-26 Seabird Tracking Study Summary - Razorbills

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KEY

Special Protection Areas

Mean number per square km

0 - 50

51 - 150

151 - 250

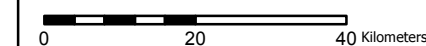
251 - 350

351 - 450

451 - 520

Horizontal Scale: 1:1,000,000

A3 Chart



N

Geodetic Parameters: WGS84 UTM Zone 30N

Produced: LG

Reviewed: CJP

Approved: CR

Date: 21/11/2011

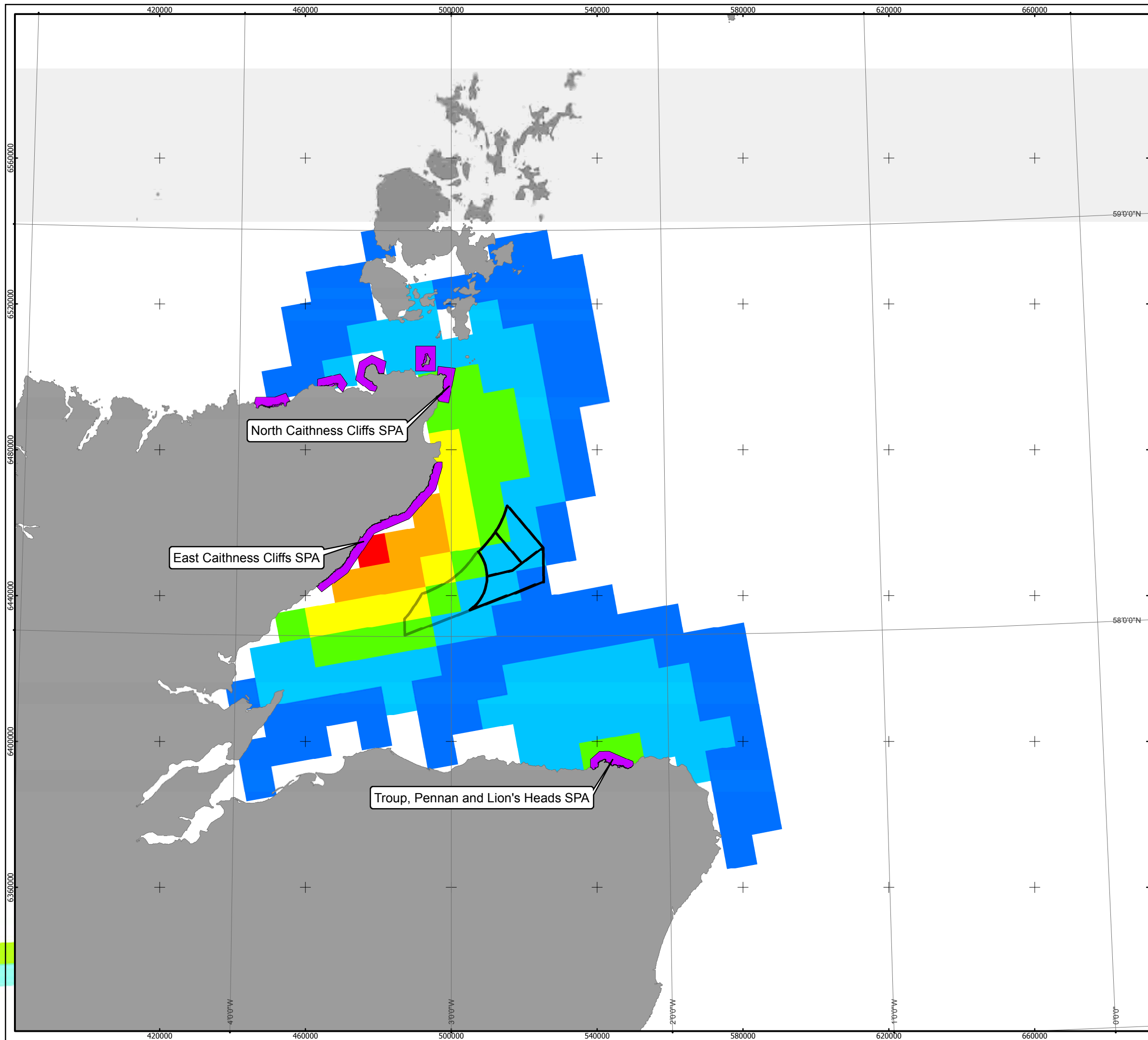
Revision: A

REF: 8460001-PPW0201-NPW-MAP-014

Fig 4.5-27 Predicted Distribution of Breeding Fulmar

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KEY

Special Protection Areas

Mean number per square km

0 - 500

501 - 1500

1501 - 2500

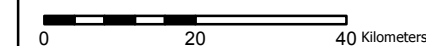
2501 - 3500

3501 - 4500

4501 - 4700

Horizontal Scale: 1:1,000,000

A3 Chart



Geodetic Parameters: WGS84 UTM Zone 30N

Produced: LG

Reviewed: CJP

Approved: CR

Date: 21/11/2011

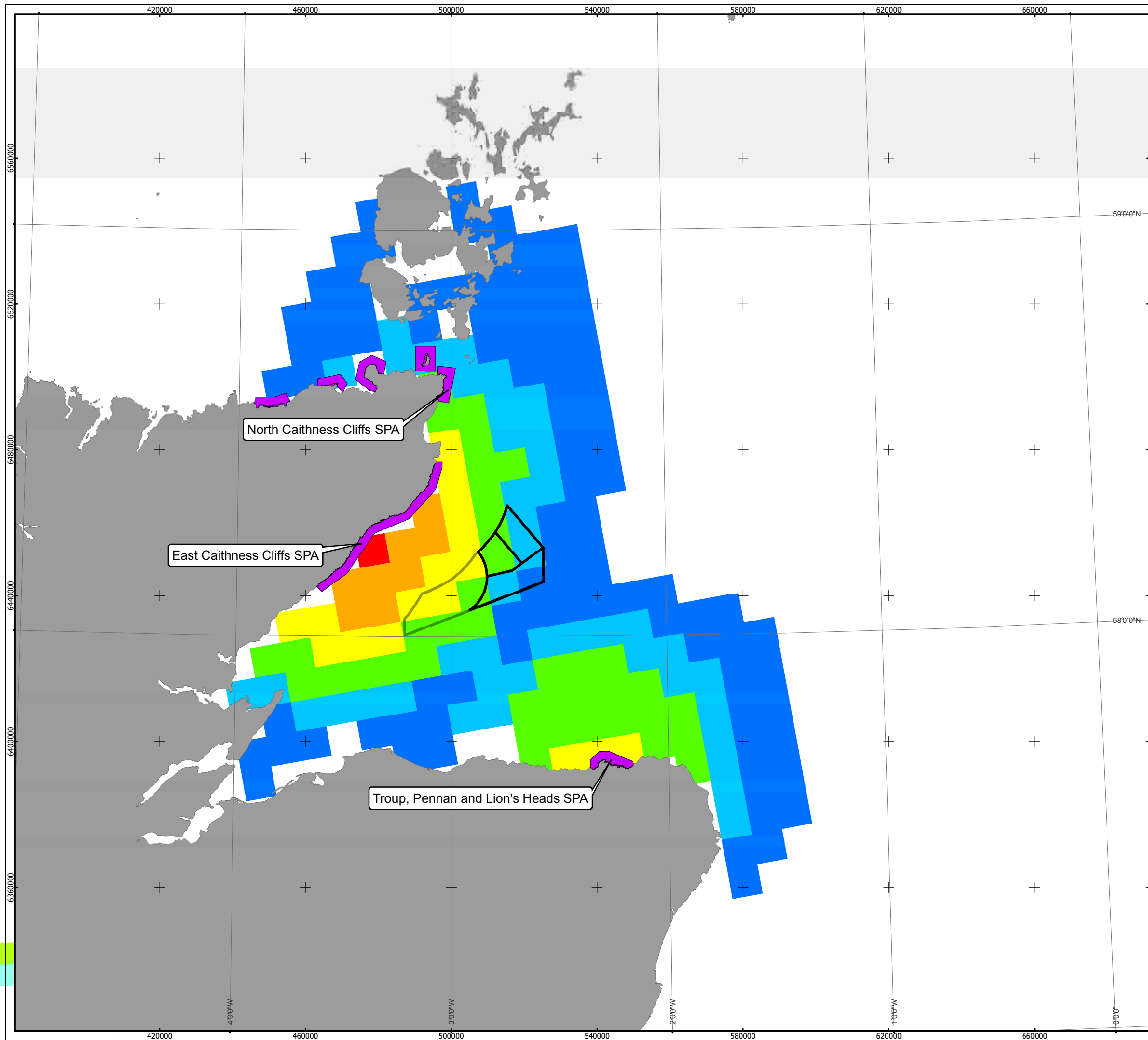
Revision: A

REF: 8460001-PPW0201-NPW-MAP-015

Fig 4.5-28 Predicted Distribution of Breeding Guillemot

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KEY


 Special Protection Areas


Mean number per square km

 0 - 250

 251 - 500

 501 - 1000

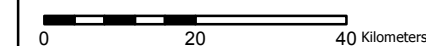
 1001 - 1500

 1501 - 2000

 2001 - 2250

Horizontal Scale: 1:1,000,000

A3 Chart



Geodetic Parameters: WGS84 UTM Zone 30N

Produced: LG

Reviewed: CJP

Approved: CR

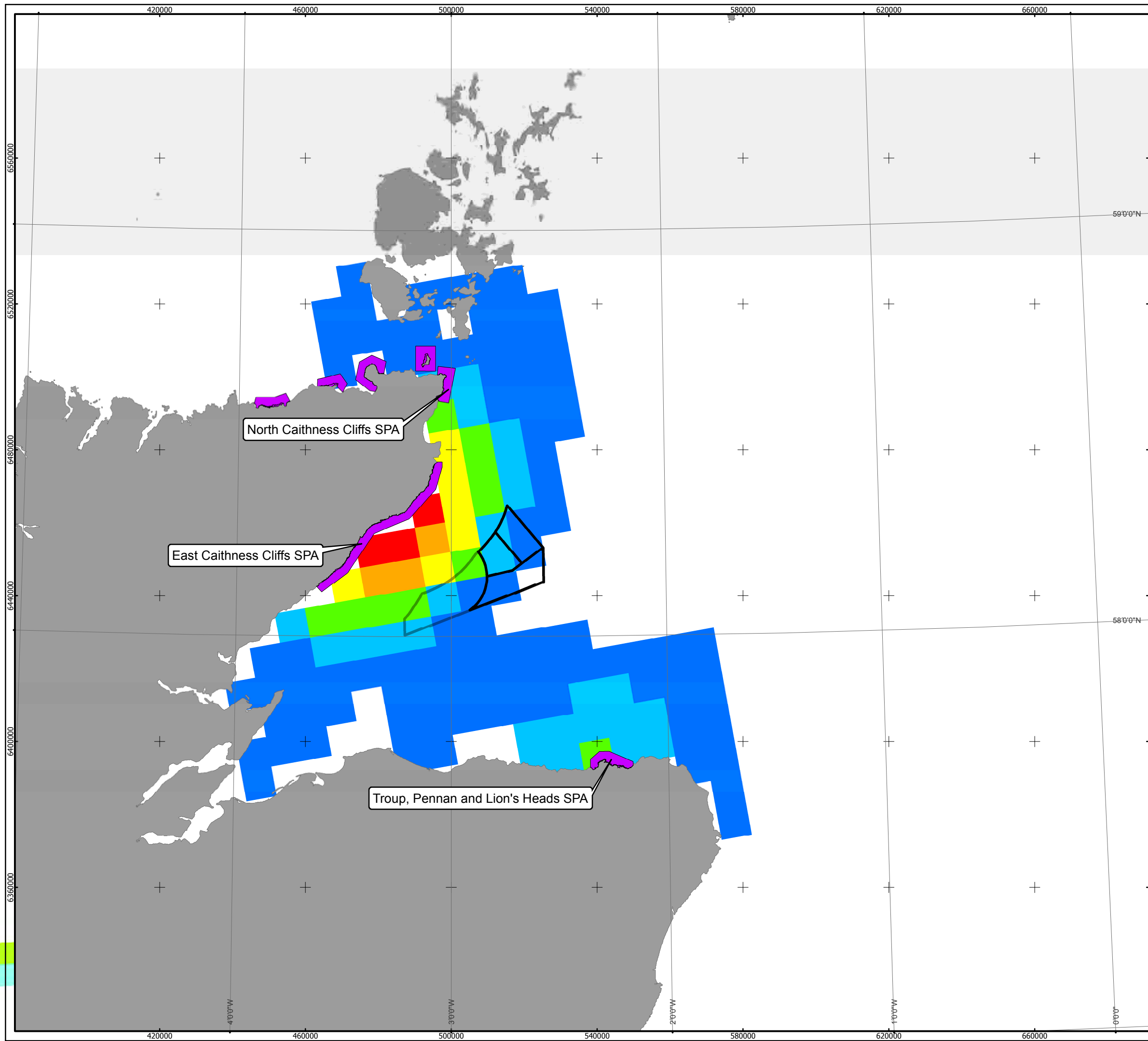
Date: 21/11/2011

Revision: A

REF: 8460001-PPW0201-NPW-MAP-016

Fig 4.5.29 Predicted Distribution of Breeding Kittiwake

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KEY

Special Protection Areas

Mean number per square km

0 - 120

121 - 240

241 - 360

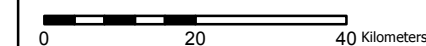
361 - 480

481 - 600

601 - 680

Horizontal Scale: 1:1,000,000

A3 Chart



Geodetic Parameters: WGS84 UTM Zone 30N

Produced: LG

Reviewed: CJP

Approved: CR

Date: 21/11/2011

Revision: A

REF: 8460001-PPW0201-NPW-MAP-017

Fig 4.5-30 Predicted Distribution of Breeding Razorbill

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